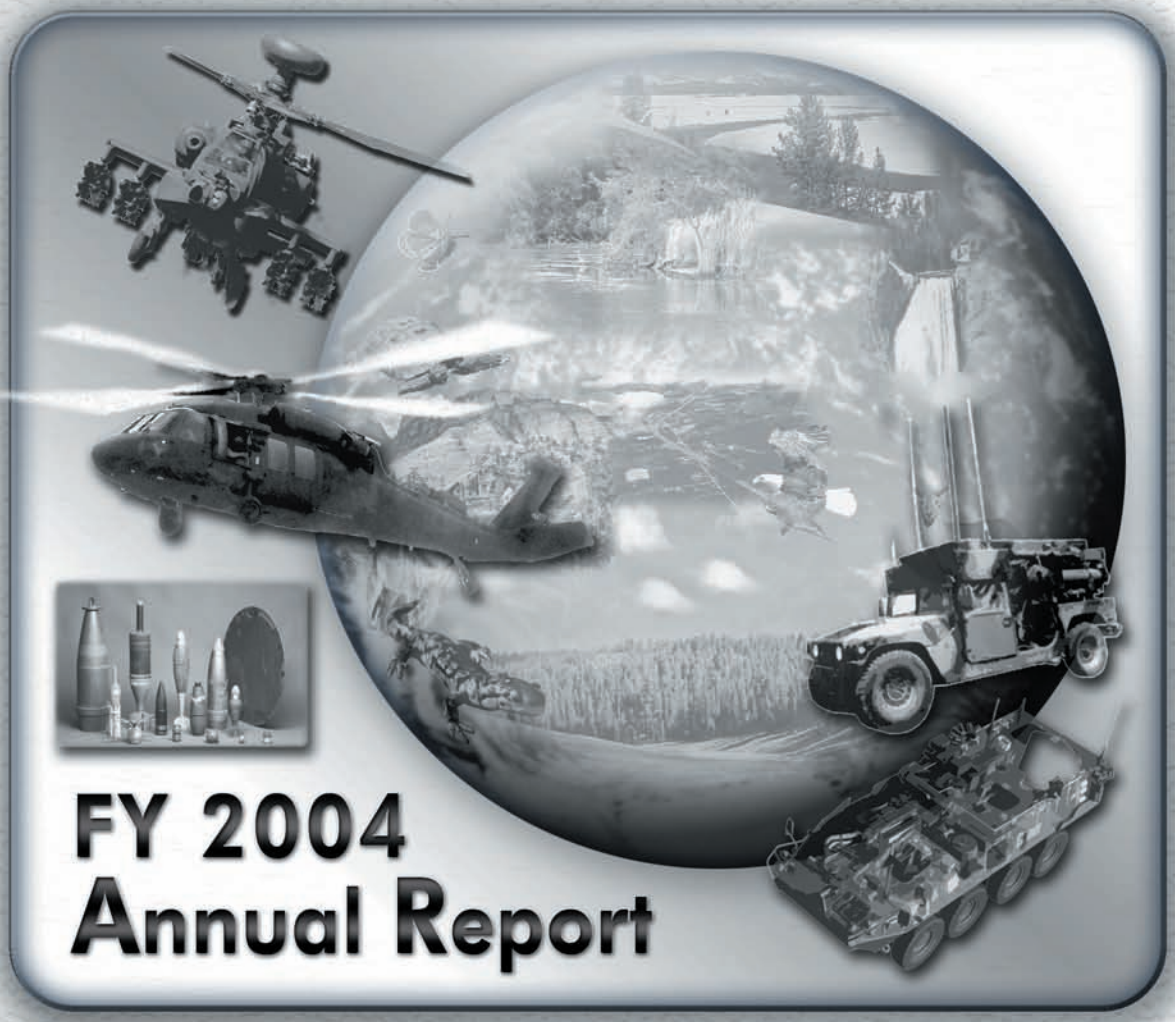
U.S. Army Environmental Center



FY 2004 Annual Report

Acquisition and Technology Division

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SFIM-AEC-ATT
5179 Hoadley Road
Aberdeen Proving Grounds, MD 21010-5401

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COMMANDER
U.S. Army Environmental Center
ATTN: SFIM-AEC-ATT (Mr. Layne Young)
5179 Hoadley Road
Aberdeen Proving Grounds, MD 21010-5401

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13. SUPPLEMENTARY NOTES

14. ABSTRACT

This report summarizes projects carried out during Fiscal Year 2004 by the U.S. Army Environmental Center's Acquisition and Technology Division. The report describes each project's participants, results, requirements, milestones and products. The Acquisition and Technology Division provides support to Headquarters, Department of the Army (HQDA), Major Army Commands (MACOMS), Installation Management Agency (IMA), and the installations on the implementation and maintenance of environmental initiatives; provide technical expertise and guidance on regulatory issues; ensure all weapons systems programs comply with Environmental, Safety, and Occupational Health Requirements; and conduct demonstrations of new and innovative environmental technologies and transfer successful technologies to the field.

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Technology Branch

APPENDICES

Introduction

This report describes current projects at the U.S. Army Environmental Center (USAEC) Acquisition and Technology Division (ATD) during fiscal year (FY) 2004. These summaries will help readers better understand the division's efforts and capabilities. Technology is a major weapon in the Army's efforts both to defend the nation and to sustain the environment. Through the programs described in this report, USAEC gives the Army access to the most effective and affordable environmental tools available.

ATD focuses on conservation, compliance and cleanup technologies and assists the Army in determining environmental impacts for weapon acquisitions, bolstering the USAEC commitment to saving money and quickly incorporating innovative ideas for its Army and Defense Department customers.

The Acquisition Branch has included weapon systems fact sheets to provide a brief explanation and report on each weapon system under review. The fact sheets include the following information:

System Description
System Data
Upcoming Major System Reviews
Current Status/Issues
USAEC Role
Weapon Systems Points of Contact

The Acquisition Branch guidance documents and the Technology Branch project descriptions serve to provide a brief summary of the content, purpose, and accomplishments of each of the many projects completed or worked on in FY04. The project descriptions include the following information:

Purpose
What problem does the project address?

Benefits
How does the project help its users?

Technology Users
Who will benefit from the project?

Description
Why was this technology developed? How does it work?
What results have been achieved so far?

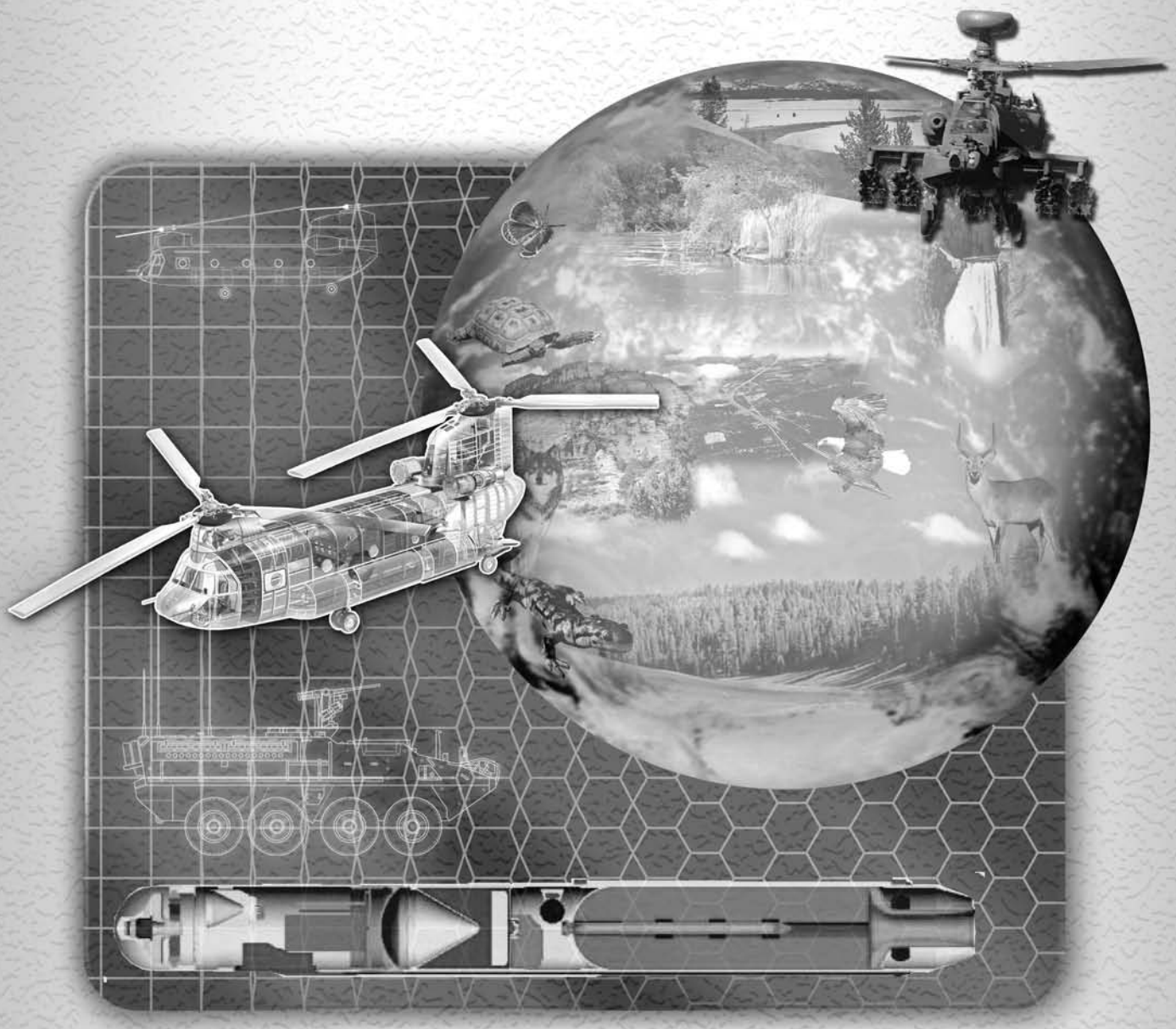
Limitations
What might affect the use of this technology?

Accomplishments and Results
What additional requirements are anticipated?

Program Partners
What organizations are participating in the project?
(Appendix B contains
a consolidated list of partners.)

Publications
What publications relate to the project?

To contact the Acquisition and Technology Division about any of the projects or information included in this report, e-mail the division at T2hotline@aec.apgea.army.mil, or call 1-800-USA-3845.



Acquisition Branch

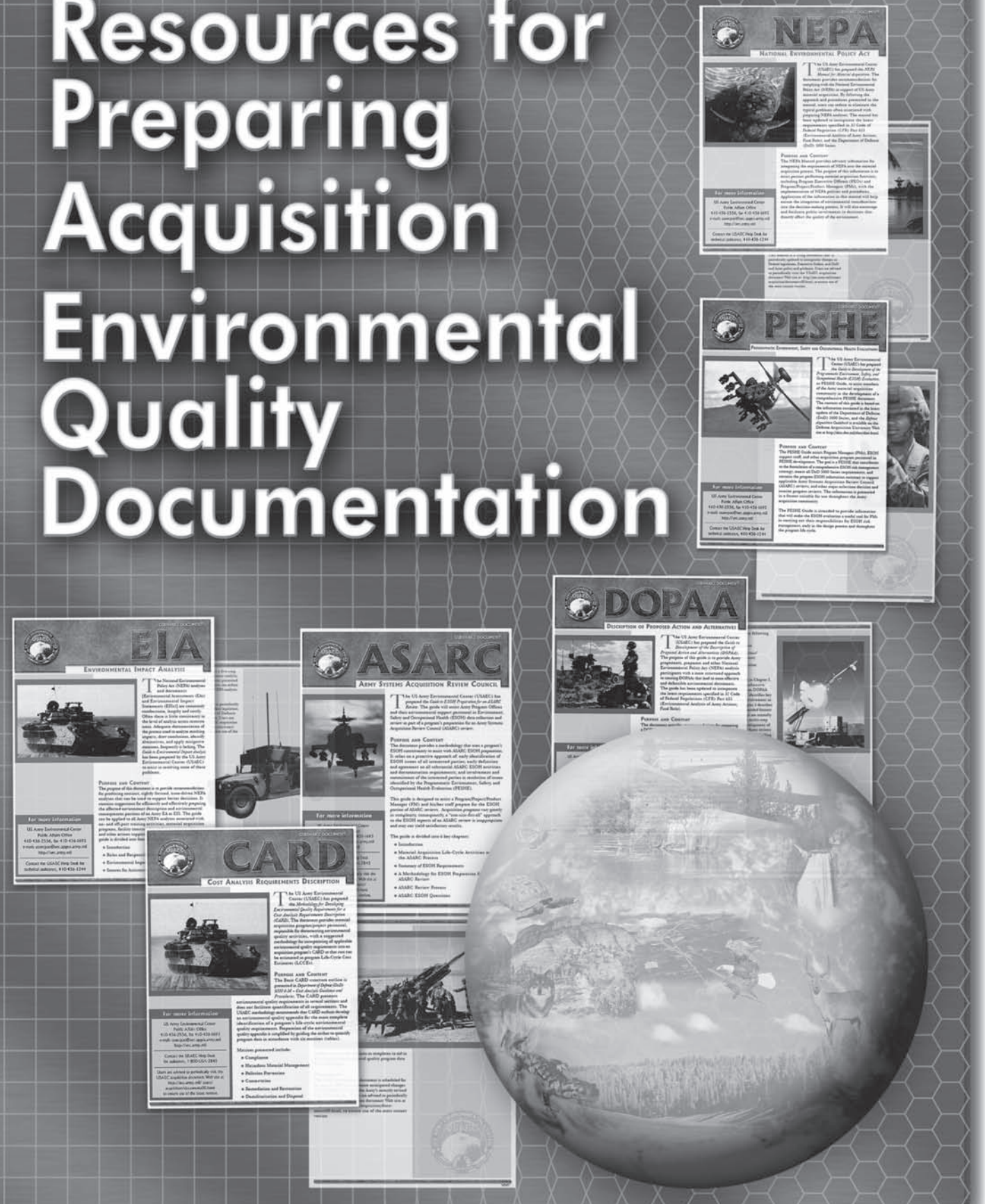
Acquisition Branch Overview

The Acquisition Branch supports the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health (DASA [ESOH])) and the Assistant Chief of Staff for Installation Management (ACSIM) by ensuring that installation environmental issues are considered in the development of new Army weapon systems. In addition, the Branch compiles information on potential weapon system impacts on installations, materiel fielding schedules, and materiel fielding locations, to support Army installations as new equipment is fielded.

Specific actions executed include:

- Provide an Environmental Quality Impact Assessment (EQIA) for ACAT I and II Weapon System programs (also known as an ASARC notebook) for the DASA (ESOH) prior to all Army Systems Acquisition Review Council (ASARC) and Cost Review Board (CRB) meetings.
- Review acquisition capabilities documents to ensure Environmental Quality requirements are included.
- Support the Deputy Assistant Secretary of the Army for Cost and Economics (DASA – CE) to review Program Office estimates for environmental quality life cycle costs.
- Collect data to define weapons system fielding impacts.
- Maintain membership on Program Managers' Integrated Product Teams.
- Coordinate activities with the Army Materiel Command/ Assistant Secretary of the Army for Acquisition, Logistics and Technology's Environmental Support Office.

Resources for Preparing Acquisition Environmental Quality Documentation



Environmental Quality Life Cycle Cost Estimate (EQLCCE)

Purpose

In response to the 1995 Defense Appropriations Act requirements, which requires the Program Manager's Office (PMO) to generate an EQLCCE, the Department of Defense (DoD) and the Services were interested in developing methodologies and databases for the analysis of environmental costs of major defense acquisitions. Responsibility for performing environmental costs analysis of Major Defense Acquisition Programs (MDAPs) in the Army is borne by the responsible PMO, Office of the Deputy Assistant Secretary of the Army for Cost & Economics (ODASA [CE]) and various DoD agencies. PMs who acquire, fund, produce, and maintain weapon systems must, in accordance with DoD 5000.2-R, determine environmental costs and impacts of weapon systems from conception through disposal.

Because of rising concerns about hidden environmental costs associated with Army weapon systems, a number of studies, including audits performed by the DoD Inspector General (IG) and the Army Audit Agency (AAA), have examined the Environmental, Safety, and Health (ESH) aspects of weapon systems acquisition. An Office of the Assistant Secretary of the Army for Installations and Environment (OASA (I&E)) briefing to OASA Research, Development and Acquisition (RDA) on 9 September 1997 stated that more than 75 percent of all Army pollution is caused directly or indirectly by weapon systems. Approximately 1.8 percent of the Army's Total Obligation Authority is spent annually on restoration, conservation, compliance, and pollution prevention.

Consequently, every effort should be made to reduce the various costs when possible.

Benefits

The most significant benefits of performing an EQLCCE for a weapon system are:

- Improving the visibility of proven and potential environmental impacts and costs of the weapon system
- Providing opportunities for the Program Manager (PM), developer and fielding installations to identify and reduce environmental costs and determine alternative decisions associated with the weapon system
- Reducing the potential risk of remediation/restoration of environmental impacts with potential cost savings to the Army

  Providing an independent cost estimate acceptable to ODASA (CE) for validation
- Assisting the PM in defining compliance issues with federal environmental regulations and DoD acquisition requirements.

Technology Users

The OASA (I&E), ODASA (CE), Program Executive Officers (PEOs), PMs, and other acquisition officials.

Description

The EQLCCE identifies and quantifies environmental costs over the entire life cycle for a weapon system. The EQLCCE is prepared in accordance with the latest version of the ODASA (CE) Cost Analysis Manual (CAM). The

EQLCCE information can be used to identify areas of improvement such as material substitution, process changes and/or recycling, and potentially reduce the overall cost of the weapon system. A Work Breakdown Structure (WBS) format is used to compile individual environmental cost elements and total costs for the entire program.

The U.S. Army Environmental Center (USAEC) has completed many EQLCCEs for different types of weapon systems. The USAEC continues to develop environmental costing information on weapon systems. This effort will greatly improve environmental costing for weapon system PMs and will assist installations in forecasting future operating costs.

Accomplishments and Results

In FY04, the USAEC has completed the following EQLCCEs for each type of weapon system in support of Cost Review Boards (CRB) and Army System Acquisition Review Councils (ASARCs):

- Aviation Systems – Advanced Threat Infrared Countermeasures
- Ground Combat Systems – Future Combat System, and Stryker
- Artillery/Missile Systems –Patriot Advanced Capability - 3, Medium Extended Air Defense System - 3, and the Joint Common Missile
- Soldier Support Systems – XM8 Lightweight Carbine

In addition to the EQLCCEs prepared in FY04, the USAEC has developed a methodology to estimate weapons system environmental quality (EQ) costs for current force weapons systems. Based on installation Service-Based Costing (SBC) data, Operating and Support Management Information System (OSMIS) weapons system density and operational tempo, conservation, compliancepollution prevention costs, as well as an overall annual EQ cost can be calculated. To date USAEC can calculate an EQ cost for every weapons system reported in the OSMIS for FY01 and FY02. When both SBC and OSMIS data for FY03 become available, the USAEC will calculate EQ costs for all FY03 reported systems, as well as calculate a 3-year average annual EQ cost for all systems reported from FY01 through FY03. The EQ costs derived from these analyses can be used as a baseline for estimating operating costs for future systems.

Lastly, the USAEC has also conducted studies to better define demilitarization and disposal costs for weapons systems. Based on data gathered from the demilitarization and disposal of current systems, as well as depot-level maintenance costs, demilitarization and disposal cost models have been developed for fixed wing aviation, rotary wing aviation, and tactical wheeled vehicle systems. The models can be used to estimate demilitarization and disposal costs for future systems. In FY05, the USAEC will conduct studies to prepare a demilitarization and disposal cost model for various ground combat and Army watercraft systems.

Program Partners

U.S. Army Environmental Center
Office of the Deputy Assistant Secretary of the Army for Cost & Economics
Army installations
Various PM offices

The U.S. Army Environmental Center (USAEC) has published an updated edition of the Guide to Environmental, Safety, and Occupational Health (ESOH) Compliance for Army Weapon Systems (February 2004). This guide was developed to assist Army Program Offices and their environmental support personnel in maintaining program ESOH compliance throughout the life of each system. This guide is a living document that is modified, as necessary, to incorporate changes in federal legislation, Executive Orders, and DoD and Army policy and guidance. Users are advised to periodically visit the U.S. Army Environmental Center (USAEC) acquisition Web site at http://aec.army.mil/usaec/acquisition and then click on documents to determine if a more up-to-date version exists. A fact sheet for the Guide to Environmental, Safety, and Occupational Health (ESOH) Compliance for Army Weapon Systems can be accessed at http://aec.army.mil/usaec/publicaffairs/acqfact00.pdf.

Purpose

The guide is intended to provide information that will help clarify ESOH compliance for Program/Project/Product Managers in carrying out their responsibilities to consider ESOH requirements and issues early in the design process, and throughout the program life cycle.

Benefits

By providing increased awareness and understanding of ESOH requirements, the use of this guide will assist PMs and their staff in maintaining regulatory compliance throughout the acquisition life cycle, and reduce the chance of program delays and cost overruns. It will also assist the PM in completing the Environmental Compliance portion of their PESHE Guide.

Technology Users

Department of Defense (DoD) PMs and program executive officers (PEOs).

Description

Environmental requirements contained in statutes, standards, regulations and executive orders, require compliance and constitute an external constraint beyond the control of the Program/Project/Product Manager (PM). The recent update to DoD Regulation 5000.2-R (DoD directive 5000-1, DoD Directive 5000-2, and the Defense Acquisition Guidebook) specifiy that the PM "shall ensure a system design that can be tested, operated, maintained, repaired, and disposed of in accordance with ESOH statutes, regulations, and policies."

ESOH requirements and constraints must be identified and communicated to all program activities, from concept to disposal, in the same manner as any other system requirement. A weapon system design cannot be considered successful if ESOH requirements are not integrated into its overall life cycle. Often, ESOH requirements prescribe what must be done and how to do it. Examples include prohibitions on the use of ozone-depleting chemicals (ODCs), consultation requirements where endangered species or historic properties may be affected, requirements relating to the management and disposal of hazardous materials and wastes, and air and water permitting requirements. These requirements can be costly to comply with early in a program, such as during testing, and even more so later in operations and system support. To facilitate compliance, ESOH requirements should be fully evaluated early in the program,

and then periodically reevaluated. In accordance with DoD 5000.2-R (Defense Acquisition Deskbook), the PM must regularly review ESOH compliance requirements and evaluate their program impact.

The guide is organized into six chapters:

- **Chapter 1** provides an introduction to the Guide, and includes a list of sources for additional ESOH-related assistance, guidance, and information.
- **Chapter 2** provides an overview of the acquisition life cycle.
- **Chapter 3** describes the importance of identifying program life-cycle activities when determining applicable ESOH compliance requirements. Specific program issues to consider are described along with discussions on the elements and unique activities associated with each Army weapon system category (commodity).
- **Chapter 4** provides a comprehensive summary of those federal, DoD, and Army ESOH-related regulatory requirements common most acquisition programs, along with those requirements unique to specific weapon system categories (commodities). A brief overview of state and local agency and foreign nation regulatory requirements is also provided.
- **Chapter 5** identifies ESOH-related activities and documentation requirements normally associated with each life-cycle phase.
- **Chapter 6** lists the references that were used in preparation of the guide.

Accomplishments and Results

The U.S. Army Environmental Center completed the draft Guide to Environmental, Safety, and Occupational Health (ESOH) Compliance for Army Weapon Systems in October 2001. The USAEC conducted an internal review on the Guide to Environmental, Safety, and Occupational Health (ESOH) Compliance for Army Weapon Systems. USAEC comments were incorporated into the Guide to Environmental, Safety, and Occupational Health (ESOH) Compliance for Army Weapon Systems (September 2002), and the U.S. Army Environmental Center (USAEC) published an updated edition of the Guide to Environmental, Safety, and Occupational Health (ESOH) Compliance for Army Weapon Systems (February 2004).

Follow-On Program Requirements

USAEC will continue to research new ESOH Compliance requirements and ESOH Compliance requirements on the horizon and periodically update the Guide to Environmental, Safety, and Occupational Health (ESOH) Compliance for Army Weapon Systems electronically on the Web site.

Program Partners

U.S. Army Environmental Center
U.S. Army Space and Missile Defense Command
Teledyne Solutions Incorporated

Guide to Environmental Impact Analysis

National Environmental Policy Act (NEPA) analyses and documents, Environmental Assessments (EAs) and Environmental Impact Statements (EISs) are commonly cumbersome, lengthy, and costly. Often, there is little consistency in the level of analysis across resource areas. The U.S. Army Environmental Center (USAEC) has published an updated edition of the Guide to Environmental Impact Analysis (February 2004). This guide was developed to assist Army Program Offices and their environmental support personnel in developing adequate environmental resource area impact analysis and documentation, as part of their NEPA analysis.

Purpose

The purpose of this document is to provide guidance, recommendations, and suggestions for producing succinct, tightly focused, issue-driven NEPA analyses that can be used to support better decisions. It contains recommendations for efficiently and effectively preparing the environment description and environmental consequence portions of an Army EA or EIS.

Benefits

By following the approach and procedures presented in this guide, NEPA preparers and analysts can reduce or eliminate many of the typical problems associated with NEPA analyses.

Technology Users

Department of Defense (DoD) PMs and program executive officers (PEOs).

Description

This guide may be applied to all Army NEPA analyses associated with on- and off-post training activities, materiel acquisition programs, facility construction and renovation projects, and other actions supporting installation operations. The Guide is divided into four key chapters: 1) Introduction; 2) Roles and Responsibilities; 3) Environmental Impact Analysis; and 4) Sources for Assistance, Guidance, and Information. The third chapter explains, in detail, a five-step process for producing a focused, consistent analysis.

Accomplishments and Results

The U.S. Army Environmental Center (USAEC) has published an updated edition of the Guide to Environmental Impact Analysis (October 2004). It can be accessed at http://aec.army.mil/usaec/acquisition/eiaguide2004.pdf. Users are advised to periodically visit the USAEC acquisition document Web site http://aec.army.mil/usaec/acquisition/documents00.html to ensure use of the latest version. A fact sheet for the Guide to Environmental Impact Analysis can be accessed at http://aec.army.mil/usaec/publicaffairs/acqfact04.pdf

Follow-On Program Requirements

USAEC has staffed this guide for approval through ASA (I&E) to ASA (ALT), and it has been posted to the ASA (ALT) digital library for dissemination and use by the Acquisition community.

Program Partners

U.S. Army Environmental Center

U.S. Army Space and Missile Defense Command

Teledyne Solutions Incorporated

Guide to ESOH Preparation for an ASARC Review

The U.S. Army Environmental Center has completed the Guide to ESOH Preparation for an ASARC Review (February 2004).

Purpose

The document provides a methodology that uses a program's ESOH constituency to assist with ASARC ESOH preparation. It relies on a proactive approach of early identification of ESOH issues of all interested parties, early definition and agreement on all substantial ESOH activities and documentation requirements, and involvement and commitment of the interested parties in the resolution of issues identified by the Programmatic Environment, Safety, and Occupational Health Evaluation (PESHE).

Benefits

The guide will assist Army Program Offices and their environmental support personnel in Environment, Safety, and Occupational Health (ESOH), in data collection and review as part of a program's preparation for an Army Systems Acquisition Review Council (ASARC) Review.

Technology Users

Department of Defense (DoD) PMs and program executive officers (PEOs).

Description

This guide is designed to assist a Program/Project/Product Manager (PM) and his/her staff prepare for the ESOH portion of ASARC reviews. Acquisition programs vary greatly in complexity. Consequently, a "one-size-fits-all" approach to ESOH aspects of an ASARC review is inappropriate and may not yield satisfactory results. This guide is divided into six key chapters: 1) Introduction; 2) Materiel Acquisition Life-Cycle Activities in the ASARC Process; 3) Summary of ESOH Requirements; 4) A Methodology for ESOH Preparation; 5) ASARC Review Process, and 6) ASARC ESOH Questions. The guide is a living document that is periodically modified to incorporate changes in federal legislation, Executive Orders, and Department of Defense (DoD) and Army policy and guidance. Users are advised to periodically visit the USAEC acquisition document Web site at http://aec.army.mil/usaec/acquisition/documents00.html, to ensure use of the most up-to-date version.

Accomplishments and Results

The U.S. Army Environmental Center (USAEC) has published an updated edition of the Guide to ESOH Preparation for an ASARC Review (February 2004). It can be accessed at the following Web address: http://aec.army.mil/usaec/acquisition/asarc04.pdf. A fact sheet for the Guide to ESOH Preparation for an ASARC Review can be accessed at http://aec.army.mil/usaec/publicaffairs/acqfact06.pdf.

Follow-On Program Requirements

USAEC will staff this guide through ASA (I&E) to ASA (ALT) for approval before posting to the ASA (ALT) digital library, for dissemination and use by the Acquisition community.

Program Partners

U.S. Army Environmental Center

U.S. Army Space and Missile Defense Command

Teledyne Solutions Incorporated

Methodology for CARD Environmental Quality Input

The U.S. Army Environmental Center (USAEC) prepared a Methodology for Developing Environmental Quality Requirements for Cost Analysis Requirements Description (CARD). The document was prepared for materiel acquisition program/project office personnel charged with the responsibility of documenting environmental quality activities, so that cost can be estimated in program Life Cycle Cost Estimates (LCCEs).

Purpose

The basic CARD structure outline is presented in DoD 5000.4-M – Cost Analysis Guidance and Procedures. The CARD outline fragments environmental quality requirement input in several sections and does not facilitate quantification of all requirements. The methodology prepared recommends that CARD authors develop an environmental quality appendix for the more complete identification of a program's life-cycle environmental quality requirements.

Benefits

The DoD Directive 5000-1, the DoD Instruction 5000-2, and the Defense Acquisition Guidebook require that environment, safety, and occupational health (ESOH) be integrated into the systems engineering process that translates operational needs and requirements into a system solution including design, manufacturing, test and evaluation, and support processes and products. This recent guidance to environmental quality costing policy states that the cost estimate must present evidence that environmental quality costs are adequately accounted for. In order for environmental quality costs to be adequately analyzed and included in the LCCE, all environmental quality requirements must be clearly identified in a program's CARD. This CARD methodology should make it easier for the PM to anticipate and include all environmental quality requirements that should be part of the CARD. Chapter six of the Army Cost and Economic Analysis Center (CEAC) Cost Analysis Manual (CAM) shall also be used to assist the PM in preparing the EQLCCE.

Technology Users

Department of Defense (DoD) PMs and program executive officers (PEOs), and DA and DoD cost analysts.

Description

Preparation of the environmental quality appendix is simplified by guiding the CARD author in quantifying program data in accordance with six matrices (tables). Matrices presented include:

- Compliance
- Hazardous Material Management
- Pollution Prevention
- Conservation
- Remediation and Restoration
- Demilitarization and Disposal

Authors may use the matrices as templates when documenting environmental quality program data for CARD input.

Accomplishments and Results

The U.S. Army Environmental Center completed the draft Methodology for Developing Environmental Quality Requirements for Cost Analysis Requirements Description (CARD) in May 2001. The USAEC forwarded review comments on the draft Methodology for Developing Environmental Quality Requirements for Cost Analysis Requirements Description (CARD), and the final Methodology for Developing Environmental Quality Requirements for Cost Analysis Requirements Description (CARD) was published in November 2001. A fact sheet for the Methodology for Developing Environmental Quality Requirements for Cost Analysis Requirements Description (CARD) http://aec.army.mil/usaec/publicaffairs/acqfact05.pdf.

Follow-On Program Requirements

An update of the Methodology for Developing Environmental Quality Requirements for Cost Analysis Requirements Description (CARD) is "on hold" until the updated DoD 5000.4-M (Department of Defense Cost Analysis Guidance and Procedures) is available. Completion of the DoD 5000.4-M is anticipated by November 2005, and the update to the Methodology for Developing Environmental Quality Requirements for Cost Analysis Requirements Description (CARD) is expected to be available during the second quarter of FY05.

Program Partners

- U.S. Army Environmental Center
- U.S Army Cost and Economic Analysis Center
- U.S. Army Space and Missile Defense Command
- Teledyne Solutions Incorporated

NEPA Manual for Materiel Acquisition

Recent government audits of selected Defense Department acquisition programs revealed that compliance with the National Environmental Policy Act (NEPA) had not been properly factored into the acquisition management process. This manual will provide information to help program managers (PMs) consider NEPA during materiel acquisition.

Purpose

To provide advisory information for integrating the requirements of NEPA called out in the 32 Code of Federal Regulations (CFR) Part 651 (Environmental Analysis of Army Actions; Final Rule), into the materiel acquisition process. An approved updating of AR 200-2 is anticipated in the near future

Benefits

This manual will simplify the NEPA process so PMs understand when to use a Categorical Exclusion (CX) or Record of Environmental Consideration (REC), an Environmental Assessment (EA) or Environmental Impact Statement (EIS), and feel comfortable with each approach.

Technology Users

Department of Defense (DoD) PMs and program executive officers (PEOs).

Description

NEPA requires the identification and analysis of potential environmental impacts of certain federal actions and alternatives before those actions can be initiated. The law also contains specific requirements for informing and involving other federal and state agencies and the public. NEPA requires a systematic, interdisciplinary approach to analyzing and considering environmental factors when planning or conducting federal agency programs and projects. The process for implementing the law is codified in Council on Environmental Quality Regulations, 40 Code of Federal Regulations (CFR) Parts 1500-1508.

Recent government audits revealed that NEPA compliance had not been properly factored into several DoD acquisition programs. This was likely due, in part, to the false assumption that NEPA is primarily of concern only to installation and facility engineers.

This manual will provide advisory information for integrating the requirements of NEPA and the 32 Code of Federal Regulations (CFR) Part 651 (Environmental Analysis of Army Actions; Final Rule) into the materiel acquisition process. The information will assist PEOs and PMs with the implementation of NEPA policies and procedures as they pertain to Army materiel acquisition.

There is a significant effort within DoD to reduce the number of mandatory policies, procedures, and practices for the acquisition of weapon systems and other Army materiel. This manual will offer PEOs and PMs flexibility in satisfying the goals of NEPA.

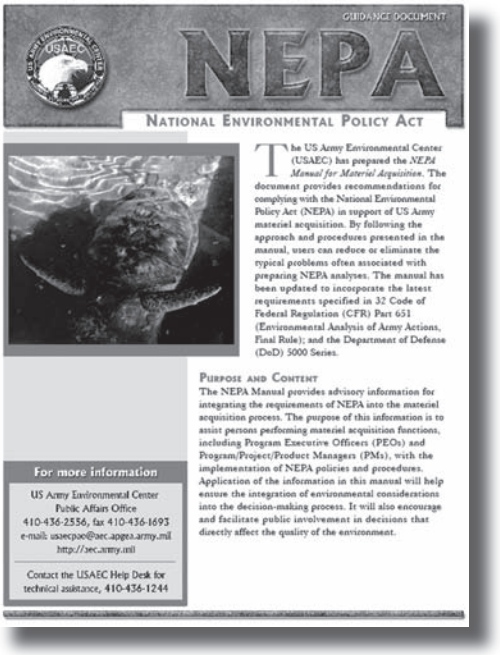
This manual is one of a set of four instructional manuals covering the integration of NEPA into Army activities. Previously published manuals cover base realignment and closure, installation operations, and on- and off-post training NEPA considerations. The manual represents a “living document” that will change as future improvements to the acquisition process occur.

Accomplishments and Results

- Published NEPA Manual for Materiel Acquisition (November 2000).
- Effective 30 October 2002, DoDD 5000.1 and DODI 5000.2 were replaced by interim guidance and DoD 5000.2-R was cancelled. The SECDEF has determined that these documents "required revision to create an acquisition policy environment that fostered efficiency, flexibility, creativity, and innovation". Replacement documents for DoD Directive 5000.1 and for DoD Instruction 5000.2 were issued on 12 May 2003.
- Updated the NEPA Manual for Materiel Acquisition in January 2004 to capture all the changes made to DoD Directive 5000.1, DoD Instruction 5000.2, latest requirements specified in the 32 Code of Federal Regulations (CFR) Part 651 (Environmental Analysis of Army Actions; Final Rule), and to address recommendations from the latest Draft of the Department of Defense Acquisition Guidebook.
- Posted a NEPA Manual for Materiel Acquisition Sheet (February 2004) on the USAEC Web page. http://aec.army.mil/usaec/publicaffairs/acqfact01.pdf.
- Posted the updated NEPA Manual for Materiel Acquisition (July 2004) to USAEC Web site and to ASA(ALT) digital library.
- http://library.saalt.army.mil/archive/Discr/2005/Final%20NEPA%20Manual%20%28Jul%202004%29.pdf.

Program Partners

U.S. Army Environmental Center
U.S. Army Space and Missile Defense Command
Teledyne Solutions Incorporated


GUIDANCE DOCUMENT

NEPA

NATIONAL ENVIRONMENTAL POLICY ACT

The US Army Environmental Center (USAEC) has prepared the *NEPA Manual for Materiel Acquisition*. The document provides recommendations for complying with the National Environmental Policy Act (NEPA) in support of US Army materiel acquisition. By following the approach and procedures presented in the manual, users can reduce or eliminate the typical problems often associated with preparing NEPA analyses. The manual has been updated to incorporate the latest requirements specified in 32 Code of Federal Regulation (CFR) Part 651 (Environmental Analysis of Army Actions, Final Rule); and the Department of Defense (DoD) 5000 Series.

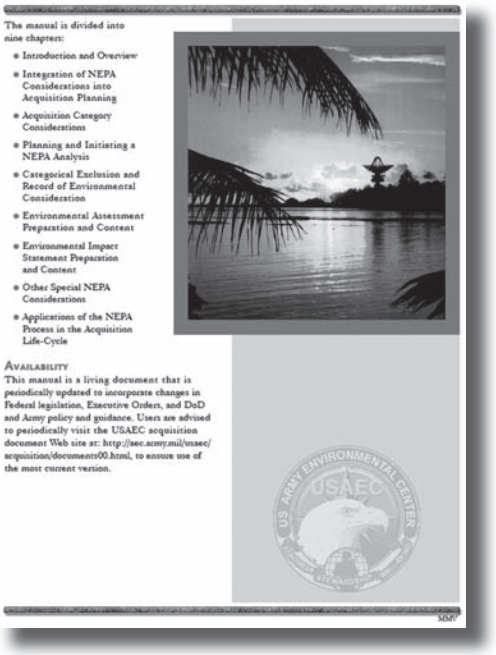
PURPOSE AND CONTENT

The NEPA Manual provides advisory information for integrating the requirements of NEPA into the materiel acquisition process. The purpose of this information is to assist persons performing materiel acquisition functions, including Program Executive Officers (PEOs) and Program/Project/Product Managers (PMs), with the implementation of NEPA policies and procedures. Application of the information in this manual will help ensure the integration of environmental considerations into the decision-making process. It will also encourage and facilitate public involvement in decisions that directly affect the quality of the environment.

For more information

US Army Environmental Center
Public Affairs Office
410-436-2556, fax 410-436-1693
e-mail: usaecpao@aec.apgea.army.mil
http://aec.army.mil

Contact the USAEC Help Desk for technical assistance, 410-436-1244


The manual is divided into nine chapters:

- Introduction and Overview
- Integration of NEPA Considerations into Acquisition Planning
- Acquisition Category Considerations
- Planning and Initiating a NEPA Analysis
- Categorical Exclusion and Record of Environmental Consideration
- Environmental Assessment Preparation and Content
- Environmental Impact Statement Preparation and Content
- Other Special NEPA Considerations
- Applications of the NEPA Process in the Acquisition Life-Cycle

AVAILABILITY

This manual is a living document that is periodically updated to incorporate changes in Federal legislation, Executive Orders, and DoD and Army policy and guidance. Users are advised to periodically visit the USAEC acquisition document Web site at: http://aec.army.mil/usaec/acquisition/documents00.html, to ensure use of the most current version.

Programmatic Environmental, Safety, and Health Evaluation Guide

Department of Defense (DoD) Instruction 5000.2 requires that all programs, regardless of acquisition category, include a programmatic environmental, safety, and occupational health (ESOH) evaluation in their acquisition strategy. The regulation does not set a format for this evaluation but requires it to describe a program/project/product manager's (PM's) strategy for meeting ESOH requirements, establishing responsibilities and tracking progress. Developing a guide for such evaluations should help PMs plan, execute, and document actions that fulfill the ESOH requirements of DoDI 5000.2.

Purpose

To develop a guide for analyzing six specific ESOH areas: National Environmental Policy Act, Environmental Compliance, System Safety and Health, Hazardous Materials, Pollution Prevention, and Explosives Safety.

Benefits

The development of an ESOH evaluation helps ensure those actions that fulfill the ESOH requirements of DoD Instruction 5000.2 are planned, executed, and documented.

Technology Users

DoD PMs and program executive officers (PEOs).

Description

DoDI 5000.2 requires that all programs, regardless of acquisition category, include a programmatic ESOH evaluation in their acquisition strategy. Early in the process, the PM must initiate the ESOH evaluation in support of a program initiation decision (usually Milestone I), and update the evaluation throughout the program's life cycle. As a living document, it must be updated to address ESOH hazard tracking (identification, proposed mitigation measures, and status), and NEPA compliance status. The DoDI (Table E3.T1. Statutory Information Requirements) requires PESHE documentation at Program Initiation (for ships), at Milestone B, at Milestone C, and for the Full-Rate Production Decision Review.

The Programmatic Environment, Safety, and Occupational Health Evaluation (PESHE) Guide can assist PMs in meeting ESOH integration requirements by providing a description of techniques, practices, and processes for integrating ESOH-related activities into the systems engineering program design process. It can help document a program's current ESOH status, establish a process for monitoring changing compliance requirements, integrate ESOH requirements into the program's acquisition strategy and other program documentation, and establish a plan of action to meet future ESOH requirements. The guide is intended to provide information and make the ESOH evaluation a useful tool for PMs in carrying out their responsibilities to consider ESOH requirements and issues early in the design process, and will help ensure potential program "showstoppers" are identified and resolved early in the acquisition process.

Accomplishments and Results

- Developed the initial PESHE Guide (July 1999).
- Published October 2001 final PESHE Guide that incorporated information from the updated and approved DoD 5000.2-R.
- Effective 30 October 2002, DoDD 5000.1 and DODI 5000.2 were replaced by interim guidance and DoD 5000.2-R was cancelled. The SECDEF has determined that these documents "required revision to create an acquisition policy environment that fostered efficiency, flexibility, creativity, and innovation." Replacement documents for DoD Directive 5000.1 and for DoD Instruction 5000.2 were issued on 12 May 2003.
- Updated the PESHE Guide in January 2004 to capture all the changes made to DoD Directive 5000.1, DoD Instruction 5000.2, latest requirements specified in the 32 Code of Federal Regulations (CFR) Part 651 (Environmental Analysis of Army Actions; Final Rule), and to address recommendations from the latest draft of the Department of Defense Acquisition Guidebook.
- Posted a PESHE fact sheet http://aec.army.mil/usaec/publicaffairs/acqfact02.pdf, on the USAEC Web page.
- Posted the updated PESHE Guide (May 2004) to USAEC Web site and to ASA(ALT) digital library. http://library.saalt.army.mil/archive/Discr/2005/Final%20PESHE%20Guide%20%28May%202004%29.pdf.

Program Partners

U.S. Army Environmental Center
U.S. Army Space and Missile Defense Command
Teledyne Solutions Incorporated

Description of Proposed Action and Alternatives Development Guide

The Description of Proposed Action and Alternatives (DOPAA) forms the framework for conducting an environmental impact analysis in accordance with the National Environmental Policy Act (NEPA) and its implementing regulations. Comprising much of the beginning portions of any Environmental Assessment (EA) or Environmental Impact Statement (EIS), the DOPAA defines the scope of the action as well as viable or reasonable alternatives, and serves as the basis on which to predict potential impacts. Development of the DOPAA helps in early coordination with other Army offices and outside agencies and, in the case of the EIS, provides the foundation for conducting formal scoping. Most important for the decision maker, the DOPAA serves as the basis for understanding alternative approaches to meeting mission needs. A flawed or incomplete DOPAA can mislead or delay the NEPA analysis process, and open the way for public controversy or, in rare instances, bring about a court order stopping the action. The U.S. Army Environmental Center published an updated edition of the Description of Proposed Action and Alternatives (DOPAA) in February 2004. The guide has been updated to incorporate the latest requirements specified in the 32 Code of Federal Regulations (CFR) Part 651 (Environmental Analysis of Army Actions; Final Rule).

Purpose

To provide proponents, preparers, and other NEPA analysis participants with a more structured approach to creating DOPAAs that lead to more effective and defensible environmental documents (EAs and EISs).

Benefits

By following the approach and procedures presented in this guide, users can reduce or eliminate the problems often associated with NEPA analyses, such as reanalysis of a constantly changing DOPAA, project delays, and cost overruns.

Technology Users

Department of Defense (DoD) PMs and program executive officers (PEOs).

Description

Following the introduction of the guide in chapter 1, chapters 2 through 4 provide comprehensive guidance and information on DOPAA development. Chapter 2 identifies key players and describes their level of involvement in the DOPAA development process; Chapter 3 describes the components of a DOPAA, recommended formats to use, and the types of information that are normally included; Chapter 4 describes a multi-step process that can be used in the development of DOPAAs for larger and more complex Army actions (e.g., research and development projects, the fielding of new weapon systems, and large training exercises), including a review of methodologies for defining the proposed action and identifying possible alternatives.

Accomplishments and Results

The USAEC published the final Guide to Development of the Description of Proposed Action and Alternatives (DOPAA) in November 2001. The U.S. Army Environmental Center published an updated fact sheet, http://aec.army.mil/usaec/publicaffairs/acqfact03.pdf, and an updated edition of the Description of Proposed Action and Alternatives (DOPAA), in August 2004. An updated edition of the Description of Proposed Action and Alternatives

(DOPAA), is on the USAEC Web page, http://aec.army.mil/usaec/acquisition/dopaaguide04.pdf.

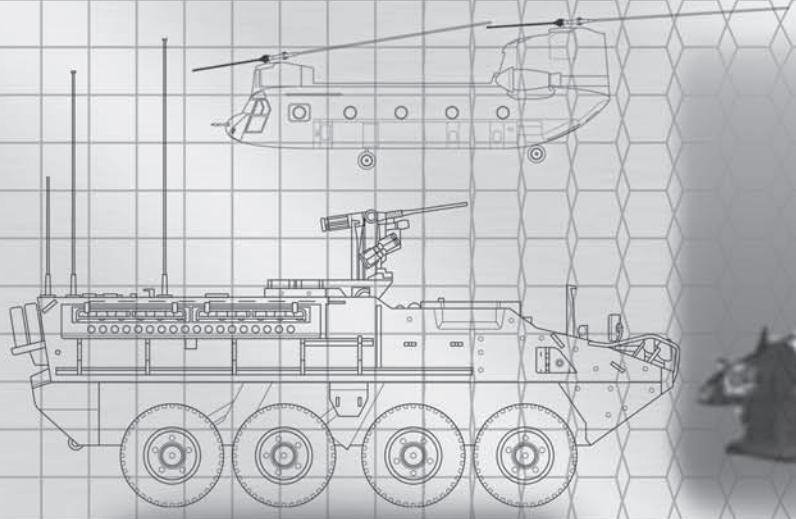
Follow-On Program Requirements

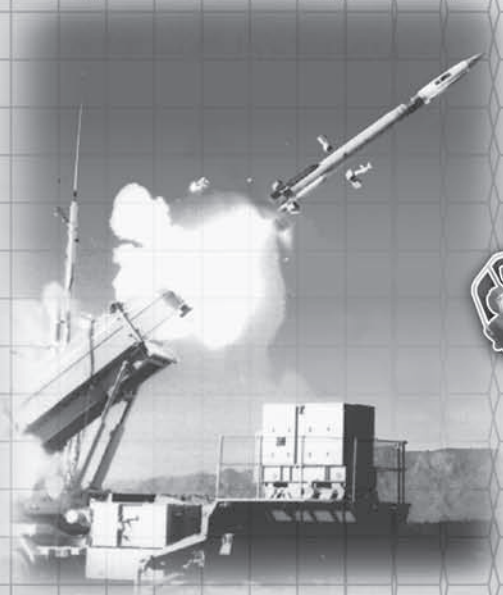
Staff the DOPAA Guide to ASA(I&E) through ASA(ALT) for approval and posting on the ASA(ALT) digital library under discretionary guidance, for use by the Acquisition community.

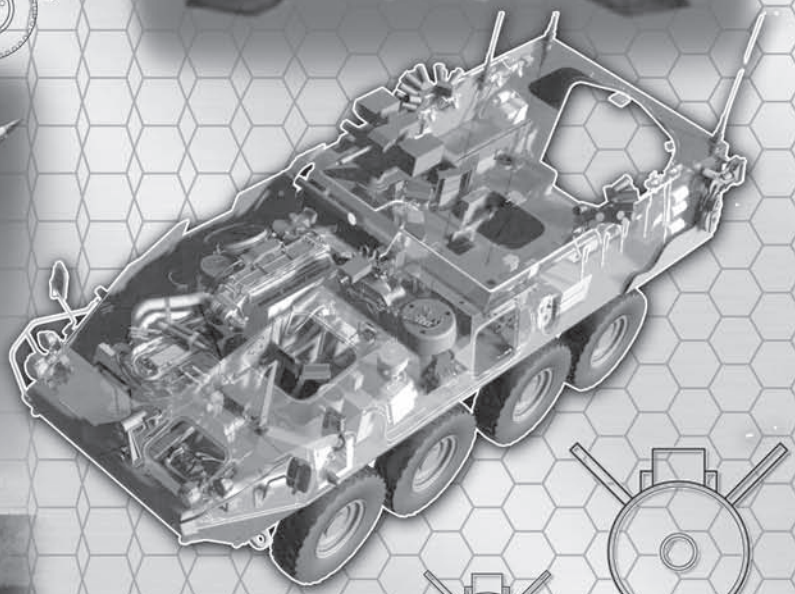
Program Partners

U.S. Army Environmental Center
U.S. Army Space and Missile Defense Command
Teledyne Solutions Incorporated

Weapons Systems Under Evaluation for ASA(I&E)/DASA(ESOH)







EXCALIBUR XM982

SYSTEM DESCRIPTION

The Excalibur XM982 is a family of precision 155 mm modular projectiles that incorporates three unique payloads. A sensor fuzed munition (SFM) variant will be used to engage self-propelled artillery and armored targets. Excalibur permits 155 mm artillery systems to regain range overmatch while precisely engaging targets at ranges up to 50 km. Excalibur is a force multiplier that increases lethality while reducing the logistical burden for legacy, interim, and objective forces.

An internal Global Positioning System (GPS) updates the inertial navigation system, providing precision guidance and improved accuracy. The GPS features a selective-availability, anti-spoofing module and an anti-jam system. Excalibur is effective in all weather and terrain. It contains a fuzing system that is set by either an enhanced portable inductive artillery fuze setter or Crusader's inductive automated fuze setter. The target, platform location, and GPS-specific data are inductively entered into the projectile's mission computer, located in the nose of the projectile. Upon firing, Excalibur will determine its up-reference using inertial sensors. A trajectory correction to optimize range takes place midway between apogee and the target. Upon arrival, the trajectory is optimized for the Unitary, SFM, or DPICM payload variants.

SYSTEM DATA

- PEO: Ammunition
- PM: Combat Ammunition Systems-Indirect Fire
- Acquisition Category: IC
- Current Phase: System Demonstration
- System Lead: Army

UPCOMING MAJOR SYSTEM REVIEWS

- DAB: Fourth Quarter 2004
- Cost Review Board: Second Quarter 2004
- ASARC: Fourth Quarter 2004

CURRENT STATUS/ISSUES

The Environmental Life Cycle Cost Estimate has been drafted (July 2002) and incorporated into the Program Office Estimate. The ASARC resulted in a review of the Excalibur Acquisition Program Baseline. The next ASARC is scheduled in the Fourth Quarter 2005. An Excalibur Safety Assessment Working Group met 15 June 2004 and reviewed Critical Safety Failure Criteria, which will be reflected in the Safety Assessment Report. Comments during the meeting targeted Hazard Analysis and identified specific testing hazards and the means by which to mitigate those hazards. Testing is accruing at Yuma Proving Ground.

USAEC ROLE

Member of the Excalibur Cost Review Board and Safety Assessment Working Group (IPT). An Environmental Life Cycle Cost Estimate (EQLCCE) has been drafted and implemented into the Program Office Estimate and is awaiting approval of the Army Cost Position, tentatively scheduled for September 2004.

WEAPONS SYSTEM POINTS OF CONTACT (PM OFFICE AND USAEC)

Picatinny Arsenal, N.J., (973) 724-3534, (732) 532-4740.

Precision Guided Mortar Munition (PGMM)

System Description

The 120 mm Precision Guided Mortar Munition (PGMM) fully supports the Army Vision as it provides organized precision strike capability to the maneuver commander. The ability to hit point targets is especially valuable in urban environments and low intensity conflicts, avoiding collateral damage and reducing the potential for civilian casualties. PGMM increases the number of stowed kills and reduces the overall logistics burden, a critical goal for early entry forces.

System Data

- PEO: Ammunition
- PM: ARDEC
- Acquisition Category: ACAT II
- Current Phase: Milestone B
- System Lead: Army

System Description

- Operational Requirements Document: August 2004
- ASARC: TBD
- DAB: TBD

Current Status/Issues

Since we announced our selection of Alliant Techsystems, Inc. (ATC) as the PGMM System Development and Demonstration (SD&D) contract, there have been two events that have kept us from awarding the contract and starting the real work in SD&D. The first has been the approval of the requirements document. After the Army approved it at the end of November, it was then forwarded to the Joint Requirement Oversight Council (JROC) for staffing. The operational requirement document (ORD) is now in paper staffing to the Vice Chairman of the Joint Chiefs of Staff for signature. The PGMM is tentatively scheduled for SD&D in September 2005.

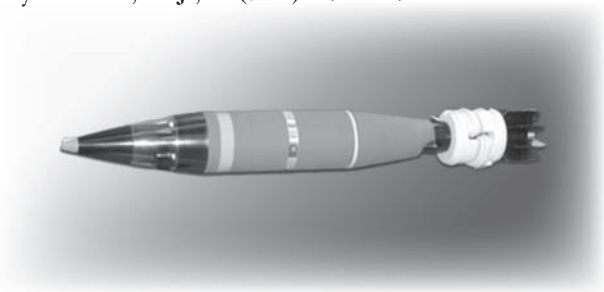
Until then, we are in a holding pattern for starting development and preparing SD&D and updating our program documentation (environmental, TEMP, etc.) As soon as something happens on the issues mentioned above, we can start planning IPT meetings to get the team up to speed on the ATK concept, and discuss the future plans.

USAEC Role

USAEC has recently reviewed and provided comments on the ORD, PESHE, and the LCEA. USAEC also is member of the Environmental IPTs and Cost IPTs.

Weapons System Points of Contact (PM office and USAEC)

Picatinny Arsenal, N.J., at (973) 724-7520.



APACHE LONGBOW HELICOPTER

SYSTEM DESCRIPTION

The AH-64A and AH-64D Apache are the Army's main attack helicopters, designed primarily to destroy heavy armor. They are dual-engine single-rotor craft with infrared and video piloting, automated target acquisition and classification, a 30 mm chain gun, Hellfire laser-guided missiles, and 2.75 inch rockets. The "A" models have been in production since 1983 with more than 800 craft in service. Since the late 90s, about 500 of the "A" models are being upgraded to the "D" model, with better avionics and instrumentation in the cockpit. Half of the new "D" models, in addition, will have the new Longbow millimeter wave fire control radar mounted on the rotor mast, capable of better terrain mapping, target detection, and targeting of the new radio frequency guided Longbow Hellfire missile.

SYSTEM DATA

- PEO: Aviation
- PM: Apache, with separate PM's for Longbow Apache, Apache Block III Modernization, and Fire
- Control Radar and Modernized Target Acquisition Sight
- Acquisition Category: ACAT IC* (see note below)
- Current Phase: III for Longbow (deployed, in operation and support phase, and in production), and pre-MS B for Block III modernization
- System Lead: Army

UPCOMING MAJOR SYSTEM REVIEWS

- None for Longbow, but MS B and C is expected for modernized Apache in the 2006-2008 time frame.

CURRENT STATUS/ISSUES

Apache completed the first multiyear Longbow upgrade contract earlier in 2002 and started into the second multiyear contract, intended to provide 500 Longbow upgrades. In 2000 there was evidently a cost increase and the program was rebaselined. As part of this effort, USAEC developed the EQLCCE. In 2002, the program was being recapitalized, including adding new components on the "D" models, but also including new components on the existing "A" models that had not been scheduled to be converted to Ds. Among these components were better night vision equipment and additional fuel capacity. These upgrades may have been driven by a GAO report in March 2001 analyzing lessons learned from the Kosovo campaign, where some Apaches were lost. A new baseline cost for this recapitalization was floated early in 2002, though it appears not to have been validated through the CEAC CRB process. It is planned to continue to use Apache in the Objective Force in 2010-2030; to accomplish that, another upgrade to produce the so-called "Modernized Apache" is expected in 2005-2008. This will upgrade the entire fleet to digital capability, ensure it can fire the Joint Common Missile, and add a more powerful/efficient engine currently in development. In mid-2004, Modernized Apache underwent scrutiny by the DoD.

*Note: Army was evidently pursuing the modernization as a block upgrade without using the milestone process, and now DoD has required that the milestone process be used, with DoD as the approving authority.

USAEC Role

Member of the Cost Integrated Process Team in the past and attendee at ASARC Integrating Integrated Process Teams. Reviewer of PESHE and NEPA documentation.

Weapons System Points of Contact (PM office and USAEC)

PM Apache: DSN: 897-4200, COMM: (256) 313-4200, Fax: (256) 313-4147.

Blackhawk Helicopter

System Description

Blackhawk is the Army's standard utility helicopter, providing light cargo transport, troop transport, and some attack functions. A benchmark of Blackhawk's capability is being able to transport a complete 11-man squad with all associated equipment, or a 105 mm howitzer with full crew and 30 rounds of ammunition. Blackhawk is the successor to the UH-1 (Huey) of Vietnam fame. It has two engines, single rotor, and can carry either 50 cal or 7.62 mm machine guns out the side doors. It started production in 1978 as the "A" model, received an engine upgrade in 1989 in the follow-on "D" model, and both the "A" and "D" models are to receive cockpit instrumentation/digital communication, airframe, rotor, and transmission upgrades as part of a recapitalization program that entered development after a late 2000 Defense Acquisition Board (DAB). Portions of the Blackhawk fleet are nearing the end of their 30-year life, and the recapitalization is intended to keep Blackhawk usable as the primary utility helicopter in the Objective Force. Blackhawks were also produced in other configurations for Special Forces, medical evacuation, and Navy sealift.

System Data

- PEO: Aviation
- PM: UH-60 Modernization
- Acquisition Category: ACAT ID (DoD Oversight)
- Current Phase: Operations and Support for the fleet, and development for the modernization/recapitalization effort
- System Lead: Army

Upcoming Major System Reviews

- Milestone C CRB, ASARC, and DAB: January-February 2005 (for recapitalization)
- Full-rate production review: FY06

Current Status/Issues

A major effort occurred about two years ago in preparation for the Milestone B DAB. Blackhawk was possibly more amenable to environmental assistance at that time since an Inspector General report had criticized the program for not having an environmental cost estimate and updated PESHE. Now the recap program is in development for about two years, after which Army and DoD MS C reviews will occur to allow implementation of the design on the fleet of Blackhawks. The PESHE and the EQ estimate were updated in November 2004.

USAEC Role

Validator of cost estimate, PESHE, and NEPA documents for ASA(I&E).

Joint Requirements

Use of communication systems that are interoperable among the DoD services.

Weapons System Points of Contact (PM office and USAEC)

PM UH-60 Modernization: DSN: 645-6545, COMM: (256) 955-6545, Fax: (256) 955-6702.

CH-47F Chinook, Improved Cargo Helicopter

System Description

The CH-47F/Improved Cargo Helicopter (ICH) is a remanufactured version (i.e., version F) of the CH-47D Chinook cargo helicopter, and will use the more powerful, efficient, and digitally controlled T55-GA-714A engine. The ICH program is intended to restore CH-47D airframes to their original condition and extend the aircraft's life expectancy another 20 years (total life of 70 years) until the 2030-2035 time frame. The program will remanufacture ~400 CH-47D aircraft, reduce the aircraft's vibration, thereby reducing Operations and Support costs, and allow the aircraft to operate on the digitized battlefield by incorporating a 1553 data bus. The ICH will also acquire the capability to carry 16,000 pounds of external/internal cargo for a 50 nautical mile combat radius at 4000 feet pressure altitude and 95 degrees Fahrenheit. In addition, the following improvements will be incorporated into the aircraft:

- Fuselage stiffening and active systems for vibration reduction (this is expected to lead to improved reliability and therefore reduced operating and support costs).
- Integrated cockpit
- Digital architecture for FORCE XXI compatibility.

Previous major system reviews are:

- Cost Review Board: Nunn-McCurdy Breach: February 2002
  FRP: October 2004
- ASARC/IPRs: MS II: May 1998
  Nunn-McCurdy Breach: March 2002

System Data

- PEO: Aviation
- PM: Cargo Helicopters with CH-47F Product Manager
- Acquisition Category: ACAT IC
- Current Phase: Low Rate Initial Production (LRIP)
- System Lead: Army

Upcoming Major System Reviews

- CRB: None
- ASARC/IPRs:
- FRP: November 2004

Current Status/Issues

Has entered LRIP, nearly completed testing, and is approaching full-rate production decision. Environmental documentation was completed. The only issue is that the Aviation Modernization program, initiated when Comanche was cancelled in early 2004, is apparently spreading Chinooks out to new fielding locations. The CH-47F program is not evaluating the environmental effects of this since CH-47F PMO is responsible only for upgrading CH-47Ds where they currently exist. Aviation Modernization does not appear to have prepared a programmatic NEPA document to assess its re-basing decision. Fortunately the new basing sites will prepare site-specific NEPA work, but that is several years in the future. The re-basing decision evidently has been made and should have been accompanied by a programmatic NEPA analysis.

USAEC Role

Reviewer of PMO's Environmental Quality (EQ) documents and provided the EQ cost estimate to ODASA-CE for inclusion into the Army Cost Position.

Joint Requirements

Ability to communicate with joint assets.

Weapons System Points of Contact (PM office and USAEC)

PMO: PM Environmental POC, (618) 234-3400.
USAEC: (410) 436-5910.

PEO Chemical and Biological Defense

Joint Biological Stand-off Detection System (JBSDS)

System Description

The JBSDS is a stand-off early warning biological detection (BD) system, and is the first joint biological stand-off detection program. The system will be capable of providing near real-time, detection of biological attacks or incidents and stand-off early warning detection/warning of biological warfare (BW) agents at fixed sites or when mounted on multiple platforms, including Nuclear Biological Chemical (NBC) reconnaissance platforms. It will be capable of providing stand-off detection, ranging, tracking, discrimination (manmade vs. naturally occurring aerosol), and generic detection (bio vs. non-bio) of large area biological warfare aerosol clouds for advanced warning, reporting, and protection.

System Data

- PEO: Joint Program Executive Office – Chemical and Biological Defense
- PM: NBC Contamination Avoidance
- Acquisition Category: III
- Current Phase: Low Rate Initial Production (Spiral 1)
- System Lead: Army

Upcoming Major System Reviews

- Milestone C, FY05 (Spiral 1)
- Milestone B, FY06 (Spiral 2)

Current Status/Issues

The JBSDS Block is using a spiral aquisition management strategy. Increment 1 provides interim capability to the Air Force and Army and will be fielded in FY06. The technology for Increment 1 is based on a 2002 Technology Readiness Evaluation. A separate Concept Capability Document is being prepared for Increment 2. Increment 2 will add better sensitivity, lower false alarms, daytime capability, on-the-move detection/discrimination, smaller size, and network remote operation capability.

USAEC Role

Assisting in review of PESHE and Programmatic NEPA document, as well as participating in the Integrated Process Team.

Weapons System Points of Contact (PM office and USAEC)

PM NBC Contamination Avoidance: (410) 436-2566.
USAEC: (410) 436-6848.

Joint Biological Point Detection System (JBPDS)

System Description

The JBPDS detects, identifies, samples, collects, and communicates the presence of biological warfare agents to enhance the survivability of U.S. Forces. The JBPDS will be capable of identifying biological warfare agents in less than 15 minutes. The detection suite will be integrated into each Service's platform or air base and port, to provide a common detection capability for joint interoperability and supportability. The JBPDS will increase the number of agents that can be identified by previous biological detectors, decrease detection and identification time, increase detection sensitivity, provide automated knowledge-based detection and identification; and provide a first-time point detection capability to the Air Force and Marine Corps.

System Data

- PEO: Joint Program Executive Office – Chemical and Biological Defense
- PM: Nuclear Biological Chemical (NBC) Contamination Avoidance
  Acquisition Category: II
- Current Phase: Low Rate Initial Production
- System Lead: Army

Upcoming Major System Reviews

- Full Rate Production Decision Review scheduled for FY08.

USAEC Role

Full Operational Test and Evaluation for Full Rate Production is scheduled for FY08.

Current Status/Issues

Assisting in review of PESHE and Life Cycle Environmental Assessment for Milestone Review.

Weapons System Points of Contact (PM office and USAEC)

PM NBC Contamination Avoidance: (410) 436-2566.

USAEC: (410) 436-6848.

Millimeter Wave (MMW)

System Description

The Millimeter Wave (MMW) Module, mounted on the M56 Large Area Smoke Generator System (SGS), is designed to provide the user with a capability to deliver large area obscurant screens to defeat radar operating in the gigahertz (GHz) frequency range, from either a stationary or mobile mode of operation. The system can also produce visible and infrared (IR) obscurant to defeat threat systems operating in the visible and infrared region of the electromagnetic spectrum. Carbon fiber material has proved to be a highly effective MMW obscurant and has demonstrated the capability to absorb radar waves and defeat radar through continuous dissemination by the MMW module. The M56 SGS is equipped with a turbine engine that provides electrical power and pneumatics to each module to disseminate obscurant into the atmosphere. Carbon fiber is disseminated from eight individual canisters, each containing 30 pounds of material, through the fluidizer and out of the ejector. The M56 SGS is capable of producing 30 continuous minutes of MMW obscurant to screen radar on the battlefield. The MMW Module is mounted on the passenger side rear fender of a M1113 High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) and is capable of disseminating obscurant material at a maximum rate of 8 pounds per minute while in stationary or mobile modes.

System Data

- PEO: Joint Program Executive Office – Chemical and Biological Defense
- PM: Nuclear Biological Chemical (NBC) Contamination Avoidance
- Acquisition Category: III
- Current Phase: System Development Demonstration Phase
- System Lead: Army

Upcoming Major System Reviews

- Milestone C, September 2006

Current Status/Issues

The Millimeter Wave module has completed developmental testing at several sites and is scheduled to go to Milestone C in September 2005. A Programmatic Environmental Assessment is being written. Toxicological studies will be performed on select species, to include birds, amphibians, reptiles, and mammals to determine potential impact on threatened and endangered species.

USAEC Role

Assisting in review of PESHE and programmatic NEPA document, as well as participating in the Test Integrated Process Team (IPT) and facilitating an Environmental IPT.

Weapons System Points of Contact (PM office and USAEC)

PM NBC Contamination Avoidance: (410) 436-2566.

USAEC: (410) 436-6848.

PEO Command, Control, and Communications – Tactical

Force XXI Battle Command Brigade and Below (FBCB2)

System Description

FBCB2 is a computer-based system installed in individual tactical vehicles and platforms for use by vehicle and small unit commanders. It provides graphical displays showing friendly units, enemy units, control symbols, and targets of interest, on a digital map background. FBCB2 lets the Soldier know where they are, where the friendly forces are, where the known enemy is, and where threats or obstacles are. It also provides the capability to display the commander's operational orders. FBCB2 acts as a digital, battle command information system that provides integrated, on the move, timely, relevant information to tactical combat, combat support, and combat service support leaders and Soldiers. It allows warfighters to pass orders, graphics, and visualize the commander's intent and scheme of maneuver, as well as providing near real-time situational awareness information and a common operating picture of the battlefield. FBCB2 interoperates with and complements the Army Battle Command Systems (ABCS) deployed at brigade and battalion.

System Data

- PEO: C3T
- PM: FBCB2
- Acquisition Category: 1C
- Current Phase: Production and Deployment
- System Lead: Army

Upcoming Major System Reviews

- None

Current Status/Issues

In Production and Deployment phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 427-3237.
USAEC: (410) 436-6849.

Global Command and Control System-Army (GCCS-A)

System Description

The Global Command and Control System-Army (GCCS-A) is the Army's Strategic and Theater Command and Control (C2) System. It provides readiness, planning, mobilization, and deployment capability information for strategic commanders. For theater commanders, GCCS-A provides Common Operational Picture (COP) and associated friendly and enemy status information, force employment planning and execution tools (receipt of forces, staging, intra-theater planning, readiness, force tracking, onward movement, and execution status), and overall interoperability with Joint, Coalition, and the tactical Army Battle Command Systems (ABCS). GCCS-A is an integral part of a coordinated Department of Defense (DoD) and Joint Technical Architecture-Army, providing information support to all levels of military command across a Common Operating Environment (COE). GCCS-A provides automated command and control tools for Army Strategic and Theater commanders to enhance warfighter capabilities throughout the spectrum of conflict during joint and combined operations in support of the National Command Authority.

System Data

- PEO: C3T
- PM: GCCS-A
- Acquisition Category: 1AC
- Current Phase: Production and Deployment
- System Lead: Army

Upcoming Major System Reviews

- Software upgrade (JC2 Block 1) Milestone B 2Q FY06

Current Status/Issues

In Production and Deployment phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 532-4041.
USAEC: (410) 436-6849.

Joint Tactical Radio System (JTRS) Cluster 1

System Description

The Joint Tactical Radio System (JTRS) program supports acquisition and fielding of Software Defined Radios (SDR) that provide interoperable communications through an internationally endorsed open Software Communications Architecture (SCA). JTRS will replace older, hardware-intensive radios with SDR in which software applications provide waveform generation and processing, encryption, signal processing, and other major communications functions. The Joint Tactical Radio System is a family of radios that are modular, multi-band, multi-mode networked communication systems. Modular design of software and hardware will facilitate upgrades and replacement of functional components. JTRS capabilities will be developed and fielded in an evolutionary manner, to provide increasing capabilities as technology development and funding permits. Cluster 1 supports requirements from the Army Aviation Rotary Wing, Air Force Tactical Control Party (TACP), and Army and USMC Ground Vehicular platforms.

System Data

- PEO: C3T
- PM: JTRS Cluster 1
- Acquisition Category: 1D
- Current Phase: System Development and Demonstration
- System Lead: Army

Upcoming Major System Reviews

- Milestone C 3Q FY06

Current Status/Issues

In System Development and Demonstration phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 532-4740.
USAEC: (410) 436-6849.

Joint Tactical Radio System (JTRS) Cluster 5

System Description

The Joint Tactical Radio System (JTRS) program supports acquisition and fielding of Software Defined Radios (SDR) that provide interoperable communications through an internationally endorsed open Software Communications Architecture (SCA). JTRS will replace older, hardware-intensive radios with SDR in which software applications provide waveform generation and processing, encryption, signal processing and other major communications functions. The Joint Tactical Radio System is a family of radios that are modular, multi-band, multi-mode networked communication systems. Modular design of software and hardware will facilitate upgrades and replacement of functional components. JTRS capabilities will be developed and fielded in an evolutionary manner, to provide increasing capabilities as technology development and funding permits. Cluster 5 satisfies requirements for handheld, man-pack, and embedded applications.

System Data

- PEO: C3T
- PM: JTRS Cluster 5
- Acquisition Category: 1C
- Current Phase: System Development and Demonstration
- System Lead: Army

Upcoming Major System Reviews

- Milestone C 2Q FY08

Current Status/Issues

In System Development and Demonstration phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 532-4740.
AEC: (410) 436-6849.

Maneuver Control System (MCS)

System Description

The Maneuver Control System (MCS) provides an automated, on-line, near-real-time capability for planning, coordinating, and controlling tactical operations. MCS automates the creation and distribution of the common tactical picture of the battlefield for the Army Battle Command System. The MCS integrates information from other Battlefield Functional Area Command and Control systems to provide timely, accurate status information and situational awareness. The main function of MCS is to distribute tactical reports and orders and allow commanders to receive, analyze, and transmit critical battlefield information. MCS is a network of computer workstations that manages information on the planning, execution, and monitoring of military operations at the Unit of Employment level and below. The MCS role in communicating battle plans, orders, and enemy and friendly situation reports makes it a key component of the Army's ongoing efforts to digitize the battlefield.

System Data

- PEO: C3T
- PM: MCS
- Acquisition Category: 1A
- Current Phase: Low Rate Production
- System Lead: Army

Upcoming Major System Reviews

- Milestone C 4Q FY05

Current Status/Issues

In Low Rate Production.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 532-4041.
USAEC: (410) 436-6849.

Warfighter Information Network-Tactical (WIN-T)

System Description

The Warfighter Information Network-Tactical (WIN-T) will be the high-speed, high-capacity backbone communications network for the Objective Force. WIN-T is composed of network infrastructure, services and interfaces that provide voice, video, multimedia, and data communications throughout the battle space. WIN-T will be modular, scalable, and capable of adapting to changes in task organization. At the Unit of Action (UA) level, WIN-T will provide required reach, reach back, and network services and interface with the Joint Tactical Radio System (JTRS). At the Unit of Employment (UE) level, WIN-T will provide the link to adjacent UE, subordinate UA, supporting base, Joint, Allied, and Coalition forces.

System Data

- PEO: C3T
- PM: WIN-T
- Acquisition Category: 1D
- Current Phase: System Development and Demonstration
- System Lead: Army

Upcoming Major System Reviews

- Milestone C 2Q FY06

Current Status/Issues

In System Development and Demonstration phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 532-4740.
AEC: (410) 436-6849.

NEPA Manual for Materiel Acquisition

System Description

Distributed Learning System (DLS) uses commercial off-the-shelf (COTS) components to the maximum extent possible to create a network of Digital Training Facilities (DTF) at Active Army installations and U.S. Army Reserve training centers. DLS facilitates the training process by shifting from dependence on synchronous, instructor-centered instruction in centralized, fixed classrooms, to more asynchronous, student-centered learning delivered at student locations. DLS achieves this by providing the enabling technology for remote instruction, bridging the geographic separation between the instructor and students through the electronic transmission, storage, and presentation of training materials. Distributed Learning (DL) is a training and educational approach that integrates information technology, connectivity, course content and human resources into a standardized holistic training system. With this approach, learning becomes student-centered, collaborative, customized, and productive. DLS uses an evolutionary acquisition strategy and a spiral development approach. Each block is a separate stand-alone increment that is not dependent upon subsequent blocks to meet its operational objectives. DLS blocks are economically and programmatically separable segments that have military use, even if no additional blocks are acquired.

System Data

- PEO: EIS
- PM: DLS
- Acquisition Category: 1AC
- Current Phase: Production and Deployment
- System Lead: Army

Upcoming Major System Reviews

- Increment 4 Milestone C 4Q FY06

Current Status/Issues

In Production and Deployment phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (757) 369-2900.
USAEC: (410) 436-6849.

General Fund Enterprise Business System

System Description

GFEBS is the U.S. Army's proposed core financial management capability for administering its general fund to improve performance, standardize processes, ensure that it can meet future needs, and provide Army decision makers with relevant, timely, and reliable information. GFEBS will be a commercial off-the-shelf (COTS) enterprise resource planning (ERP) system. The Army seeks a COTS solution that is certified by the Joint Financial Management Improvement Program (JFMIP) and that meets the requirements of the Federal Financial Management Improvement Act of 1996 (FFMIA) and Guide to Federal Requirements for Financial Management Systems. The Army will select a systems integrator (SI) that proposes the COTS GFEBS solution that best meets the Army's requirements. The Army expects the Systems Integrator to develop and implement the solution Army-wide. GFEBS development and implementation will include setup, user training, change management, and system operations and maintenance. The system will be phased in over approximately five years. As GFEBS is implemented, it will replace the Standard Finance Systems (STANFINS), Standard Operations and Maintenance, Army R&D System (SOMARDS), and Defense Joint Accounting System (DJAS).

System Data

- PEO: EIS
- PM: None designated
- Acquisition Category: 1AM
- Current Phase: Technology Development
- System Lead: Army

Upcoming Major System Reviews

- Milestone B 4Q FY05

Current Status/Issues

In Technology Development phase.

USAEC Role

General oversight of the program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: POC not designated.
USAEC: (410) 436-6849.

Global Combat Support System-Army (GCSS-A)

System Description

Global Combat Support System - Army (GCSS-A) is the Army's portion of an integrated multi-service Global Combat Support System (GCSS). GCSS-A will combine the functions of legacy logistics systems into a single system. GCSS-A will support Army logistics for supply, maintenance, transportation, property accountability, and ammunition. GCSS-A will, over time, replace or interface with all existing automated Combat Support Systems (CSS). The new system will also encompass personnel, financial, medical, and other non-logistics CSS functions. GCSS-Army will consist of a series of functional modules such as Supply, Property, Maintenance, and Management. Each module will run at any level or organization where the Army performs that function.

System Data

- PEO: EIS
- PM: GCSS-A
- Acquisition Category: pre-MDAP
- Current Phase: Technology Development

Upcoming Major System Reviews

- Milestone B 3Q FY05

Current Status/Issues

In Technology Development phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (804) 734-7665.
USAEC: (410) 436-6849.

Transportation Coordinators-Automated Information for Movement Management II (TC-AIM II)

System Description

Transportation Coordinator-Automated Information for Movement Management (TC-AIM) is a joint service system to support movement management of personnel, equipment, and supplies from home station to the conflict and back. TC-AIM Block 1 (TC-AIM I) is the current fielded system. TC-AIM I is based on a client server architecture and uses commercial off-the-shelf (COTS) servers, workstations, laptops, and Automatic Identification Technology equipment. TC-AIM Block 2 (TC-AIM II) has completed testing and is ready for fielding. TC-AIM II is based on a Web-based architecture. TC-AIM II also adds an enterprise management system and the ability to host multiple related logistics applications on the same platform. TC-AIM assists in the identification of unit personnel and equipment necessary to support combatant commander requirements and the production of documentation required for movement. TC-AIM passes movement requirements to the appropriate organizations to order strategic transportation, and supports commanders with in-transit visibility of assets. TC-AIM also supports day-to-day traffic management functions at installation level, in-theater distribution, and transportation movement control.

System Data

- PEO: EIS
- PM: TC-AIM
- Acquisition Category: 1AM
- Current Phase: Production and Deployment
- System Lead: Army

Upcoming Major System Reviews

- Block 3 Milestone B 2Q FY06

Current Status/Issues

In Production and Deployment.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (703) 752-0775.
USAEC: (410) 436-6849.

PEO Ground Combat Systems

Future Combat System

System Description

The Future Combat System (FCS) is a highly integrated structure of manned and unmanned air and ground assets, bound by a distributed network to act as a unified combat force. The FCS is the core building block for the Unit of Action (UA) and enables UA operations, missions, and tasks as defined in the UA Operational and Organizational (O&O) plan. The FCS-equipped UA conducts full spectrum operations: offensive, defensive, stability, and support, to include participation and support for homeland security, the global war on terrorism, and transition to subsequent operations and missions. The FCS-equipped UA is the decisive ground force across the entire range of conflict, from small-scale contingencies (SSC) to major combat operations (MCO). The FCS-equipped UA is organized to be the dominant force in future operations regardless of the terrain or weather, and during periods of limited visibility. It is optimized to perform tactical maneuvers and assaults fully integrated with fire to: 1) be the decisive force that closes with and destroys the threat; 2) see, decide, and act first, maximizing the advantage of overmatching lethality at standoff ranges; 3) continuously maneuver throughout an expanded non-contiguous distributed battle-space from one dominant position to another; 4) complement integrated air operations; 5) develop the situation out of contact and initiate contact on its own terms and conditions; 6) maximize its superior situational awareness/ understanding, enabled by a shared common operating picture and network; and 7) enable a command-centric battle command.

FCS family of systems is comprised of "18 +1" advanced, networked air- and ground-based maneuver, maneuver support, and sustainment systems that include manned and unmanned autonomous platforms. FCS is networked via Command, Control, Computers, Communications Intelligence, Surveillance and Reconnaissance (C4ISR) architecture, including networked communications, network operations, sensors, battle command systems, training, and manned and unmanned reconnaissance and surveillance capabilities that enable dominant situational understanding, and the execution of operations at a level of synchronization heretofore unachievable.

The eight manned ground platforms include: 1) Infantry Carrier Vehicle (ICV); 2) Mounted Combat System (MCS); 3) NLOS Cannon (NLOS-C); 4) NLOS Mortar (NLOS-M); 5) Reconnaissance and Surveillance Vehicle (R&SV); 6) Command and Control Vehicle (C2V); 7) FCS Recovery and Maintenance Vehicle (FRMV); and 8) Medical Vehicle (MV). The ten unmanned systems include: 1) Unmanned Aerial Vehicle (UAVs) Class I; 2) Unmanned Aerial Vehicle (UAVs) Class II; 3) Unmanned Aerial Vehicle (UAVs) Class III; 4) Unmanned Aerial Vehicle (UAVs) Class IV; 5) Armed Robotic Vehicle (ARV) (two variants); 6) Multifunction Utility/Logistics and Equipment vehicle (MULE) (three variants); 7) Small Unmanned Ground Vehicle (SUGV); 8) NLOS-Launch System (NLOS-LS); 9) Unattended ground sensors (UGS) (two variants), and 10) Intelligent munitions system (IMS).

System Data

- PEO: Ground Combat Systems
- PM: Unit of Action
- Project Leader: (586) 574-7102; DSN: 786-7102
- Acquisition Category: 1D
- Current Phase: MS B – November 2003, FCS IPR – 15 October 2004
- System Lead: Army

Upcoming Major System Reviews

FCS DAB Review – November 2004; Definitization of Revised Program – January 2005

Current Status/Issues

Upon reviewing lessons learned in combat and conducting a detailed analysis of the current and future threat environment, the Army concluded that certain changes were necessary in the UA Program to facilitate spiraling out of enabling capabilities to the current force. Additionally, the Army, in response to many internal and external program assessments, sought to reduce program integration risks by conducting more robust experimentation of future capabilities as they become available. PM UA and Lead System Integrator (LSI) are evaluating alternatives to mature and accelerate the most critical and promising technologies within the UA, enabling the Army to start fielding initial network capabilities to the current force in FY 2008. This action will significantly increase connectivity, intelligence, and information sharing within fielded units, while simultaneously demonstrating incremental capabilities on the road to fielding of the future force. This approach allows the Army to incorporate UA technological developments as new technologies mature, while maintaining a comprehensive approach to the development of the Army's future force. System acceleration will enable the commander to execute the battle with superior situational awareness, shape the battlefield with standoff precision fires and effects with long-range non-line of sight (NLOS) weapon systems, and enhance synchronized operations through an integrated network. Fielding future force capabilities to current force units will be accomplished in discrete "spirals" starting in FY08. Development and demonstration of the C4ISR network and System of System Common Operating Environment (SoS COE), unattended munitions, sensors, and unmanned air and ground vehicles will be prioritized. The FCS program will embrace evolutionary acquisition through Spiral Development employing a design, build, experiment, and test approach in concert with the user, in place of the current concurrent development construct. The schedule will be expanded to address internal and external assessment recommendations, and provide the Army with near-term funds required for current operations, and will deliberately identify and assess spiral-out candidate technologies and capabilities for integration into Current Forces Unit of Action.

USAEC Role

Participate as a member on the FCS Environment, Safety, and Occupational Health (ESOH) Working Group by reviewing and commenting on Programmatic Environment, Safety, and Occupational Health Evaluation, participating in the FCS Advanced Collaborative Environment (ACE) ESOH Compliance database

design, review of FCS Test and Evaluation Master Plan, review of Prohibited Material Usage Approval Process, and review of FCS National Environmental Policy Act (NEPA) compliance strategy. USAEC prepared an Environmental Quality Impact Assessment for ASA (I&E) to support MS B decision in November 2003 and for IPR in October 2004. USAEC provided support to the Office of Deputy Assistant Secretary of the Army for Cost & Economics (ODASA-CE) in the development of the Environmental Quality Life Cycle Cost Estimate (EQLCCE) portion of the Army Cost Position (ACP) for the Cost Review Board in May 2003.

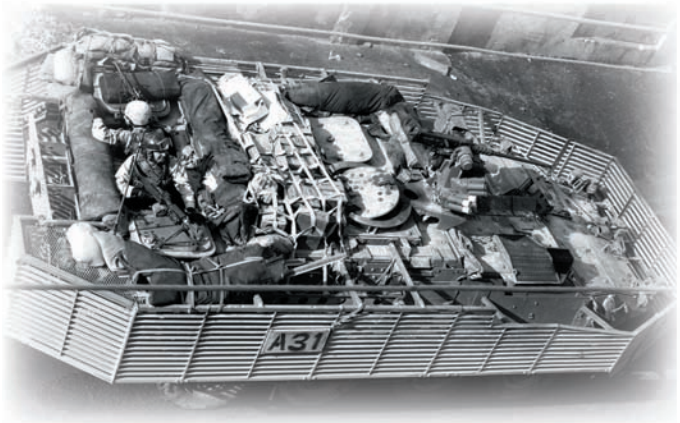
Weapons System Points of Contact (PM office and USAEC)

Technical Director:(586) 574-8631.
Department of Army System Coordinator: (703) 695-8488.
USAEC POC: (410) 436-6854.

Stryker

System Description

The National Military Strategy requires an Army that is rapidly deployable and strategically responsive across the full spectrum of operations. The Stryker Brigade Combat Team encompasses capabilities and characteristics that were needed but were not available until the first SBCT was declared operationally capable. The new Stryker enables the Army to respond immediately to urgent operational requirements. The Stryker family of vehicles consists of two variants: the Infantry Carrier Vehicle (ICV) and the Mobile Gun System (MGS). The ICV is a troop transport vehicle capable of carrying nine infantry soldiers, their equipment, and a crew consisting of a driver and a vehicle commander. The MGS is designed to support the infantry and incorporates a 105 mm turreted gun and an autoloader system designed to defeat bunkers and breach double-reinforced concrete walls. The principal technologies for these vehicles include: Force XXI Battle Command Brigade and Below (FBCB2); Enhanced Position Location Reporting System (EPLRS); Remote Weapon Station (RWS); 14.5 mm Ceramic/Composite Armor; Near Term Digital Radio (NTDR); Medical Communications for Combat Casualty Care (MC4); Soltam 120 mm Mortar System; NBC Sensor Site; Long Range Advanced Scout Surveillance System(LRAS3); M6A1E4 with automatic loader; and the installation of reactive armor.



System Data

- PEO: Ground Combat Systems
- PM: Stryker
- Acquisition Category: 1D
- Current Phase: MS III (ICV, Commander's Vehicle (CV), Reconnaissance Vehicle (RV), Fire Support Vehicle (FSV), Engineer Squad Vehicle (ESV), Medical Evaluation Vehicle (MEV), Anti-Tank Guided Missile (ATGM)) – December 2003; MS III for Mortar Carrier B (MC-B) – September 2004; MS II for MGS & Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) – September 2004
- System Lead: Army

Upcoming Major System Reviews

- MS III for MGS – 2QFY07; MS III for NBCRV – 4QFY07

Current Status/Issues

The program continues to progress notwithstanding continuing, ongoing challenges in MGS development and testing, and fielding, deployment, and sustainment of other systems. The PMO met with the Defense Acquisition Board (DAB) on 9 September 2004 and has received verbal approval for Full Rate Production Decision of the Mounted Mortar Carrier, and for Low Rate Initial Production (for 17 vehicles) of the NBCRV. Although MGS reliability continues to be a concern at upper management levels, the DAB also verbally approved the production of 14 MGS LRIP vehicles to support planned testing and long lead for the remaining 58 LRIP vehicles. A full production decision of the 58 Low Rate Initial Production (LRIP) vehicles is planned in June 2005 and is contingent on the results of the planned reliability testing in FY05. The 3/2 Stryker Brigade Combat Team (SBCT) has been deployed and has been in combat operations (as of 1 October 2004) for an excess of 322 days. Operational Readiness Rates (ORR) have consistently remained above 95 percent with more than 3.3 million miles on the fleet with increased hostile operations. The transition of the 2nd brigade is proceeding on schedule with no known issues. The first three 120 mm mounted mortar carriers are to be delivered to the Army in October 2004 for fielding to the SBCT 3 (172nd Infantry Brigade, Fort Richardson, Alaska). Testing to verify corrective actions are anticipated to begin in November 2004. The 14.5 mm armor qualification is now complete. Stryker has fully qualified armor configurations for all vehicles in production. In addition, all deficient panels on fielded vehicles have been identified, and will be replaced with the new fully qualified configurations. PMO is currently preparing to procure 3rd Brigade of Slat Armor for Stryker brigades. MGS reliability growth effort continues on schedule. Training was provided to both contractor and government personnel. This training will help in the Ammunition Handling System (AHS) replenisher design. Contractor shakedown testing continues at Aberdeen Proving Ground in preparation for additional reliability testing scheduled to begin at the end of October 2004.

USAEC Role

Participate as a member on Stryker Environmental Management Team by reviewing and commenting on Programmatic Environmental Assessments, Programmatic Environment, Safety, and Occupational Health Evaluation, Stryker Environmental Management System, and in ESOH Risk

Identification/Management process. USAEC reviewed and provided comment on SBCT Fielding Environmental Impact Statements (EISs). USAEC prepared an Environmental Quality Impact Assessment for ASA (I&E) to support MS III decision for (ICV, CV, RV, FSV, ESV, MEV. ATGM) in December 2003, for MS III decision for MC-B in September 2004, and for MS II decisions for NBCRV and MGS in September 2004. USAEC provided support to the Office of Deputy Assistant Secretary of the Army for Cost & Economics (ODASA-CE) in the development of the Environmental Quality Life Cycle Cost Estimate (EQLCCE) portion of the Army Cost Position (ACP) for the Cost Review Board (CRB) in January 2004 and again in September 2004.

Weapons System Points of Contact (PM office and USAEC)

Technical Director: (753) 586-2025.

Department of Army System Coordinator: (703) 607-7154.

USAEC POC: (410) 436-6854.

PEO Intelligence, Electronic Warfare and Surveillance

Advanced Threat Infrared Countermeasures/ Common Missile Warning System (ATIRCM/CMWS)

System Description

The ATIRCM/CMWS consists of three basic components: (1) a missile detector, (2) infrared and laser jammers to deflect missiles, and (3) a flare and chaff release unit to deflect missiles. The missile detector (which can issue a warning signal) may be used alone, or with either or both of the units which can deflect the missiles. The system functions automatically, detecting a missile, passing the information to the controller for the infrared and laser jammers, which track the missile and steer the infrared and laser on a narrow beam to the missile; if these measures do not deflect the missile, then the expendables (i.e., chaff and flares) are automatically engaged. ATIRCM/CMWS was initially a joint program with the Air Force and Navy, but they dropped out of the program. The system is scheduled to be installed on Army helicopters.

System Data

- PEO: Intelligence and Electronic Warfare Sensors
- PM: Aviation Electronics Systems
- Acquisition Category: ACAT IC
- Current Phase: LRIP (limited rate production)
- System Lead: Army

System Data

- ASARC and CRB: February 2005 CMWS Full Rate Production decision
- ASARC and CRB: Fall 2005 ATIRCM Full Rate Production decision

Upcoming Major System Reviews

This program's concept initiation was in 1991, and development started in 1995. It was a joint program until the late 1990s. With the withdrawal of Navy and Air Force, the planned buy quantity dropped from ~3000 to ~1000 units, and the unit cost increased. This triggered a Nunn-McCurdy breach, and CEAC developed an Army Cost Position in 2000 to support a new Acquisition Program Baseline. It was approved and the program continued. In 2001, FY03-07 funding was zeroed out for all except development, but with aircraft losses occurring in Operation Iraqi Freedom/Operation Enduring Freedom, funding was restored in 2003, and now the program is on the fast track. The missile detection subsystem (CMWS) was more effective than the missile deflection (ATIRCM) portions, and was separately put into LRIP in February 2002 to fill a rush request from Special Operations Command. Hence, CMWS and ATIRCM are now progressing through separate milestones.

USAEC Role

Member of the Cost Integrated Process Team and attendee for ASA(I&E) at ASARC Integrating Integrated Process Teams. Validates environmental quality costs, PESHE, and NEPA documents for ASA(I&E).

Weapons System Points of Contact (PM office and USAEC)

PM Aviation Electronic Systems: DSN: 897-4101, commercial: (256) 313-4101, Fax: (256) 313-0106.

Aerial Common Sensor (ACS)

System Description

The Aerial Common Sensor (ACS) is the Army's next generation airborne Intelligence, Surveillance, and Reconnaissance (ISR) system. ACS will provide the ground commander with timely and precise information of the enemy's location on the battlefield. ACS is composed of an airborne platform (fixed-wing aircraft) with multiple, controllable sensors. The Aerial Common Sensor (ACS) airborne system contains sensors that provide SIGINT (Signals Intelligence), IMINT (Imagery Intelligence) and MASINT (Measurements and Signals Intelligence) information. The ACS will be based on the Embraer ERJ 145 jet. The U.S. Navy will adopt the same platform as a replacement for the P3 Orion. ACS can operate in different modes and is connected to the Global Information Grid (GIG) and the national ISR infrastructure. It is rapidly self-deployable and able to arrive in theater ahead of the Army's main force and ready to operate. It has a relatively small forward footprint and provides highly accurate intelligence information on a continuous and real-time basis. The aircraft will employ a robust suite of communications equipment for rapid dissemination of collected intelligence information. ACS replaces the current Corps and EAC Airborne Reconnaissance Low (ARL) and Guardrail Common Sensor (GRCS) airborne ISR systems. The major benefit of ACS over other

surveillance systems is the use of multiple sensors and the fusion of the multi-sensor information into a single, coherent picture of the enemy on the battlefield. The key to using this capability is to "cross-cue" information received from one sensor with other sensors within the system in order to improve the chances of locating enemy targets and providing a precision location. Cross-cueing of sensors within the same platform is expected to greatly reduce the response time, especially for time-critical targets. This multi-sensor collaboration is one of the biggest challenges of the ACS Program.

System Data

- PEO: IEW&S
- PM: ACS
- Acquisition Category: pre-MDAP
- Current Phase: System Development and Demonstration
- System Lead: Army

Upcoming Major System Reviews

- Milestone C 4Q FY08

Current Status/Issues

In System Development and Demonstration phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 427-1802.
USAEC: (410) 436-6849.

Distributed Common Ground Station-Army (DCGS-A)

System Description

The Distributed Common Ground System – Army (DCGS-A) is part of the DoD Distributed Common Ground/Surface System (DCGS) family of systems. DCGS-A is an integrated Intelligence, Surveillance, and Reconnaissance (ISR) ground processing system whose core functions are receipt and processing of ISR sensor data; control of selected sensor systems; intelligence synchronization; ISR planning; reconnaissance and surveillance (R&S) integration; fusion of sensor information; and direction and distribution/dissemination of sensor information. The DCGS-A will be the Army's primary ISR tasking, collection, analysis, fusion exploitation, and dissemination (TPED/TPPU) system. It will consolidate and replace the ISR processing capabilities currently provided by the All Source Analysis System (ASAS), the CI/HUMINT Information Management System (CHIMS), the Tactical Exploitation System (TES) Family of Systems, the Guardrail Information Node (GRIFN), the Guardrail Common Sensor

(GRCS) Integrated Processing Facility (IPF), the Prophet Control, and the JSTARS Common Ground Station (CGS). The DCGS-A is a distributed "system-of-systems" interconnected via networks. This distributed system-of-systems capability provides commanders, decision makers, and analysts with real- and near real-time ISR data and information, at all echelons. Sensors are connected to the DCGS-A via sensor data links and communications systems. DCGS-A will process both military intelligence and non-MI sensor data. The ISR domains covered by the sensors are: IMINT (Imagery Intelligence), MASINT (Measurement and Signature Intelligence), SIGINT (Signal Intelligence), and HUMINT (Human Intelligence). The DCGS-A consists of fixed, mobile, and embedded configurations interconnected via the GIG, WIN-T, and JTRS and other networks; data and information is automatically shared between respective users and distributed databases.

System Data

- PEO: IEW&S
- PM: DCGS-A
- Acquisition Category: pre-MDAP
- Current Phase: Systen Development and Demonstration
- System Lead: Army

Upcoming Major System Reviews

- Milestone C 4Q FY06

Current Status/Issues

In System Development and Demonstration phase.

USAEC Role

General oversight of program and review of acquisition documents.

Weapons System Points of Contact (PM office and USAEC)

PM: (732) 427-5165.
AEC: (410) 436-6849.

Advanced Precision Kill Weapon System (APKWS)

System Description

The APKWS will provide a low-cost precision-attack capability to destroy targets not suited for heavier anti-tank weapons or outside the range of helicopter cannon, as a complement to the current unguided rockets, anti-tank missiles, and cannon on current and planned helicopters. The APKWS will be a mid-air to long-range weapon that will increase stowed kills, and provide point-target accuracy, reducing collateral damage. The APKWS will be used as a direct-attack weapon during all attack and reconnaissance missions, to destroy light armor, vehicles, structures, bunkers, light shipping, air defense, military operations in urban terrain (MOUT) targets, and exposed enemy personnel. It will be capable of being used as an indirect fire weapon when coordinated with a remote designated laser.

As a direct fire weapon, the APKWS will provide close support of ground forces conducting fires that extend the tactical reach of those maneuver forces. High precision and reduced collateral damage make the APKWS particularly suitable for operations in built-up and populated areas. As an indirect fire weapon designated by a remote ground laser, the system will serve as an additional weapon capability for designation-capable units.

The APKWS will be compatible with existing laser designator systems on the AH-64A/D and OH-58D Kiowa Warrior helicopters, as well as the RAH-66 Comanche.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: II
- Current Phase: System Development and Demonstration
- System Lead: Army
- Terminated January 2005.

Upcoming Major System Reviews

Monitoring any reactivation of the system.

Current Status/Issues

Member of the R&R, CRB-WG, and T&E Integrated Process Teams attending meetings and reviewing documents and providing comments, notebooks, etc.

USAEC Role

USAEC: (410) 436-6842.

Weapons System Points of Contact (PM office and USAEC)

COMBINED AGGREGATE PROGRAM

SYSTEM DESCRIPTION

The Combined Aggregate Program (CAP) consists of the Phased Array Tracking to Intercept of Target (PATRIOT), the PATRIOT Advanced Capability-3 (PAC-3) missile, and the Medium Extended Air Defense System (MEADS) programs. The PATRIOT and PAC-3 systems currently provide lower tier air and missile defense to protect maneuver forces and other critical forward-deployed assets throughout all phases of tactical operations. The MEADS will enhance this concept with improved technology and transportability. The system will interoperate with the air, space, and missile defense (ASMD) system of systems (SoS). It will be interoperable with other airborne, ground-based, and sea-based sensors and have improved seeker/sensor components. The MEADS will provide air and missile defense of vital corps and division assets associated with Army and Marine Corps maneuver forces. MEADS will provide forces with defense against multiple and simultaneous attacks by tactical ballistic missiles, stressing cruise missiles, and other air-breathing threats. MEADS will have a netted distributed architecture with modular components to increase survivability and flexibility of employment in a number of operational configurations. The CAP increments will maintain the current PATRIOT capability to protect the forces during the incremental transformation to MEADS. Given these characteristics, the system can rapidly respond to a variety of crisis situations and satisfy the needs of the Joint Combatant Commanders (COCOM).

SYSTEM DATA

- PEO: Missiles and Space (formerly Tactical Missiles)
- PM: Lower Tier Air and Project Office PM: Medium Extended Air Defense System
- PM: PATRIOT Advanced Capability-3
- Acquisition Category: ID
- Current Phase: MEADS: System Development and Demonstration PAC-3: Engineering and Manufacturing Development
- System Lead: Army

UPCOMING MAJOR SYSTEM REVIEWS

- CARD/ICARD: TBD
- POE/CCA: TBD
- ACP: TBD
- Cost Review Board: TBD
- ASARC: TBD
- DAB: TBD

CURRENT STATUS/ISSUES

Fielding of the basic PATRIOT system to U.S. Forces is complete. The system is deployed in the continental United States, Europe, Korea, and Southwest Asia. The PAC-3 missile has completed the flight test phase of

engineering and manufacturing development. Additional flight testing was initiated in the second quarter of FY04 and is ongoing. The PAC-3 system has entered a series of low-rate initial productions. MEADS received MS B approval in July 2004. No issues are currently pending.

USAEC Role

USAEC performs independent Environmental Quality Impact analyses and cost analyses for the Deputy Assistant Secretary of the Army (Installations and Environment), to ensure Army weapon systems programs meet requisite environmental criteria prior to milestone reviews.

Weapons System Points of Contact (PM office and USAEC)

PATRIOT/PAC-3: (256) 955-5117 (DSN 645).
USAEC: (410) 436-6853 (DSN 584).

Guided Multiple Launch Rocket System (GMLRS)

System Description

The Guided Multiple Launch Rocket System (GMLRS) supports Army transformation as a Legacy-to-Objective Force precision-guided munition with increased overmatch capabilities and reduced logistics, as compared to current freeflight rockets. GMLRS will be employed with the M270A1 upgraded MLRS tracked launcher and the HIGH Mobility Artillery Rocket System (HIMARS) wheeled launchers. GMLRS is an international cooperative development program with the United Kingdom, Germany, France, and Italy.

GMLRS munitions have greater accuracy with a resulting higher probability of kill, smaller logistics footprint, minimized collateral injury, and minimized damage to unintended or non-military targets. There are two variants of the GMLRS: the dual-purpose improved conventional munitions (DPICM) variant (warhead consists of 404 small anti-personnel and anti-material grenades that are dispersed over the specific target). These complementary capabilities cover many target types and target conditions expected in future conflicts.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: IC
- Current Phase: LRIP (DPICM) and SDD (Unitary)
- System Lead: Army

Upcoming Major System Reviews

- ACP: June 2005
- Cost Review Board: May 2005
- ASARC: June 2005

Current Status/Issues

EQLCCE and PESHE are being updated.

USAEC Role

Member of the R&R, Cost and T&E Integrated Process Team attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

High Mobility Artillery Rocket System (HIMARS)

System Description

The High Mobility Artillery Rocket System (HIMARS) is a C-130 transportable-wheeled version of the Multiple Launch Rocket System (MLRS) launcher that is mounted on a five-ton Family of Medium Tactical Vehicle (FMTV) truck chassis. It will carry one launch pod containing six MLRS rockets or one Army Tactical Missile System (Army TACMS) missile, and be capable of firing all current and future MFOM rockets and missiles. It operates with the same MLRS command, control, and communications as well as the same size crew. The HIMARS Fire Control System (FCS) will be common with the M270A1 FCS and fully interoperable with all allied and North Atlantic Treaty Organization MLRS users. The HIMARS will consist of a launcher, two re-supply vehicles (RSV) with material handling equipment (MHE), and two re-supply trailers (RST). The launcher consists of a chassis with a man-rated cab, launcher loader module (LLM) and existing fire control system.

It provides the Objective and Legacy Force an early-entry MLRS capability in a lighter weight, more deployable system. The HIMARS is a "Legacy to Objective Force" system, and is an Office of the Secretary of Defense (OSD) Pilot Program established in response to section 912C of the FY98 Department of Defense (DoD) Appropriations Bill; to address product support and total ownership cost reduction. Army and Congressional interest in HIMARS resulted in FY99/00 budget increases that accelerated to FY05 the First Unit Equipped (FUE) date to the XVIII Airborne Corps (Fort Bragg, N.C.) from March 2005.

HIMARS is being synchronized with GMLRS DPICM for FRP June 2005.

HIMARS is currently fielded at Fort Bragg, N.C.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: IC
- Current Phase: LRIP going into FRP December 2005
- System Lead: Army

Upcoming Major System Reviews

- CARD: December 2004
- Cost Review Board: May 2005
- ASARC: June 2005

USAEC Role

EQLCCE and PESHE are being updated.

Current Status/Issues

Member of the R&R, CRB-WG, and T&E Integrated Process Team attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

Improved Target Acquisition System (ITAS)

System Description

The Tube-Launched, Optically-Tracked (TOW), Wire Command-Link guided missile Improved Target Acquisition System (ITAS) is critical to the current and future forces. ITAS is the Reconnaissance, Intelligence, Surveillance, and Target Acquisition (RISTA) platform for light, airborne, air assault, and Stryker Brigade Combat Team (SBCT) forces.

ITAS is a major product upgrade modification to the light infantry's exciting M220 TOW 2 system. The ITAS modification kit consists of an integrated day/night sight lithium-ion battery power source, and a modified traversing unit.

ITAS is a multi-mission weapon system used not only as a tank killer, but also as the task force's long-range surveillance asset. With the PAQ-4/PEO-2 Laser Pointer, it is used for .50 caliber or Mk-19 grenade engagements. TOW 2B Aero (extended range) provides an extended maximum range to 4,500 meters for long-range engagement of armored vehicles, and the TOW Bunker Buster is designed for MOUT/bunker engagements during assault operations.

ITAS has second-generation infrared sensor technology and provides gunners with more than double the detection and recognition range of the AN/TAS TOW sight. ITAS also provides improved probability of hit through aided target tracking, improved missile flight operations, and an elevation brake to minimize launch transients.

ITAS has an improved design that greatly reduces its number of components, minimizing logistics support and equipment requirements. Built-in-test (BIT) diagnostics and improved man-machine interfaces will greatly improve target engagement performance. The performance-based logistics support contract will reduce ITAS support cost to 50 percent of the TOW 2 support cost.

ITAS will replace TOW 2 in light infantry units and operate from the High Mobility Multipurpose Wheel Vehicle (HMMWV), the dismount tripod platform, and light armored vehicles.

System Data

- PEO: Air and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: III
- Current Phase: Fielding
- System Lead: Army

Upcoming Major System Reviews

- CARD: TBD (to be determined)
- POE/CCA: TBD
- ACP: TBD
- Cost Review Board: TBD
- ASARC: TBD
- DAB: TBD

Current Status/Issues

Currently monitoring any upgrades to the system.

USAEC Role

Member of the R&R, CRB-WG and T&E Integrated Process Team attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

Joint Common Missile

System Description

The Joint Common Missile (JCM) is an extended range, precision guided, air-to-surface weapon providing both precision point target and fire-and-forget capability to be employed against targets in day, night, obscured battlefield, and adverse weather conditions. Attack and reconnaissance/attack helicopters and fixed-wing aircraft require an advanced air-to-surface weapon to provide precision targeting at greater range in battlefield environmental conditions to accomplish their missions. For joint and coalition attack aviation platforms, JCM will enhance targeting capabilities, increase lethality, extend range, and increase aircraft survivability.

The JCM uses advanced seeker technologies to combine improved: precision point, fire-and-forget (both active and passive), lock on before launch (LOBL) and lock on after launch (LOAL), adverse weather, and obscured battlefield targeting capabilities when compared to current air-to-ground missiles systems. The precision point targeting capability will allow the missile to engage targets designated autonomously (by the launch platform) or cooperatively (e.g., ground observers, manned/unmanned

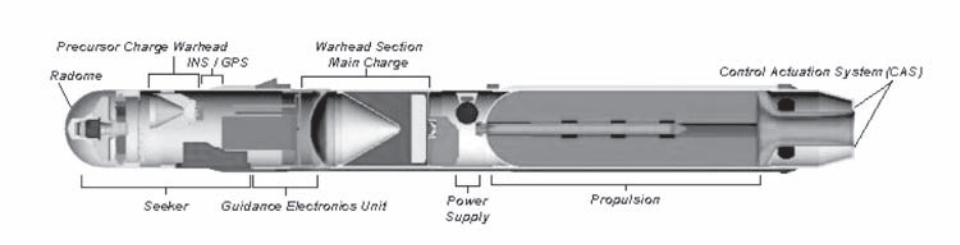
aircraft, or other joint and combined arms platforms). The fire-and-forget capability will allow the missile to LOBL or LOAL and navigate to a target without additional input from the launcher or other outside sources. It is designed to destroy the most advanced threat armored vehicle and provide increased lethality against an expanded, non-traditional (other than armored vehicle) target set.

The JCM consists of a multi-mode seeker, guidance electronics unit, warhead assembly, boost/sustain propulsion unit, and a control actuation system. The missile software will be designed for modularity, flexibility, reuse, and growth. The missile is mounted on and fired from a launcher. Any hardware or software modifications will depend on the host platform that the JCM will interface with. The four major functional subsystems of the missile include Armament, Guidance and Control, Propulsion, and the Airframe. The armament subsystem houses the main warhead. The guidance and control subsystem performs target tracking and missile steering from launch to target intercept and house the precursor warhead. The propulsion subsystem houses the boost-sustain rocket motor. The airframe provides the basic structural support of the missile and produces lift and control forces. A notional depiction of the major missile components is shown below.

JCM is designed to replace the Hellfire II and Longbow Hellfire missiles. Additionally, it will be compatible with the Hellfire II and Longbow Hellfire missile platforms and their associated launch rails. Weight of the encased missile will not exceed 49.98 kg (108 pounds). The JCM is designed for a range of 16+ km after launch from a rotor wing, taking approximately 90 seconds to travel that distance. For rotor wing (RW) applications, the JCM must operate over temperature extremes from + 71°C to – 43°C, and have a minimum smoke propellant formulation.

The tri-mode seeker is the most critical and expensive part of the weapon system. The combination of the three sensors — Semi-Active Laser (SAL), Millimeter Wave (MMW) radar, and Imaging Infrared (IIR) — in one missile aperture, together with the inertial navigation capabilities, offers significant improvements in performance over conventional single sensor missile systems. The use of MMW radar offers the capability to find targets in reasonably large target uncertainty areas (TUAs) at ranges out to 16 Km. The use of the IIR sensor during the terminal portion of the flight can compensate for the poor hit point distributions resulting from MMW guidance and provide improved Probability of Kill (P_k) for a large number of target types. The use of the IIR sensor with the SAL sensor will allow consistent missile lethality performance despite variations in laser designation quality. With an IIR seeker and Global Positioning System (GPS) availability, the JCM can fly long ranges and acquire stationary targets totally passively, without any emissions from either MMW radar or laser designators. The measurement of target properties in multiple spectral bands can enhance the performance of automatic target recognition (ATR) algorithms. Attempts to use countermeasures against JCM will be made more complicated by the availability of the three sensors.

The JCM is designed to defeat a wide spectrum of targets including heavy armor (T-90 PIP1), soft armor (BMP and ZSU), Military Operations Urban



Terrain (MOUT) structures (building and bunkers), and patrol craft (up to corvette class, Tarantul). Each of these targets requires specific defeat mechanisms to achieve the required lethality. Additional JCM targets include air defense, command and control units, transporter erector launchers, helicopter, ammunition dumps and fuel depots.

JCMs use of a multi-mode seeker and other technical design specifications to meet requirements of the U.S. Army, Navy, Marine Corps, and UK aviation will allow a high degree of commonality across a large number of platforms and minimize the life-cycle cost of the combined services.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- PM: Joint Common Missile (JCM)
- Acquisition Category: ID
- Current Phase: System Design and Development
- System Lead: Army

Upcoming Major System Reviews

- System cancelled January 2005

Current Status/Issues

Non-applicable

USAEC Role

Integrated Process Team (IPT) membership – Program Management/Senior IPT; ESOH IPT; Supportability/Safety IPT; and System Test and Evaluation IPT.

Weapons System Points of Contact (PM office and USAEC)

PM JCM: (256) 313-0826.

USAEC, Acquisition Branch: (410) 436-6842.

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System

System Description

The JLENS is a cost-effective, airborne sensor platform that provides over-the-horizon land attack cruise missile defense; enhances cruise missile detection; and provides extended engagement ranges that support the Air-Directed Surface-to-Air Missile (ADSAM) engagement concept for current air defense weapons such as PATRIOT, Standard Missile, Advanced Medium Range Air-to-Air Missile, and ultimately the Medium Extended Air Defense System and the Corps Surface-to-Air Missile System.

The JLENS sensor suite consists of surveillance radar (SR) and precision track and illumination radar (PTIR). SR provides a long-range air picture enhanced by identification of friend or foe (IFF). This information, distributed via the Joint Data Network and Joint Composite Tracking Network (presently LINK16 and cooperative engagement capability), contributes to the Semi-Automated Imagery Processing (SIAP). PTIR is a steerable, lightweight array capable of tracking multiple targets in a sector. JLENS prioritizes remote and local tracks autonomously or accepts external requests for precision tracking and engagement support.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- PO Cruise Missile Defense Systems
- Acquisition Category: II
- Current Phase: Concept and Technology Development
- System Lead: Army

Upcoming Major System Reviews

- CARD: November 2004
- POE/CCA: 2QFY05
- ACP: 2QFY05
- Cost Review Board: 2QFY05
- ASARC: 2QFY05
- DAB: To be determined

Current Status/Issues

The JLENS is currently in the concept and technology development phase of the acquisition cycle and is preparing for an upcoming Milestone B. JLENS PMO personnel are cooperating with USAEC personnel with a program review and performance of an independent Environmental Quality Impact Analysis and Environmental Quality Life Cycle Cost Analysis. A draft JLENS PESHE currently is under review at the PMO.

USAEC Role

USAEC performs independent Environmental Quality Impact analyses and cost analyses for the Deputy Assistant Secretary of the Army (Installations and Environment) to ensure Army weapon system programs meet requisite environmental criteria prior to milestone reviews.

Weapons System Points of Contact (PM office and USAEC)

JLENS: (256) 313-3032 (DSN 897).
USAEC: (410) 436-6853 (DSN 584).

Line-of-Sight Anti-Tank (LOSAT)

System Description

The Line-of-Sight Anti-Tank (LOSAT) weapon system is an integral component of the Army Vision. LOSAT consists of four hypervelocity kinetic-energy missiles (KEM) and a second-generation, forward-looking, infrared (FLIR)/TV acquisition sensor, mounted on an air-mobile High Mobility Multipurpose Wheeled Vehicle (HMMWV) chassis. Key LOSAT advantages include:

- KEM overmatch lethality, which defeats all anticipated future armored-combat vehicles and
- Hardened high-value targets, including bunkers and reinforced urban structures
- Extended range greater than all armored gun systems
- Deployability, including UH-60L sling load and C-130 air drop
- Compatibility with early-entry forces.

LOSAT also provides increased survivability and countermeasure effectiveness and will operate to the maximum range of direct-fire combat engagements, providing dramatically increased rates of fire and enhanced performance under day and night, adverse weather, and obscured battlefield conditions.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: II
- Current Phase: MS C
- System Lead: Army

Upcoming Major System Reviews

- CARD: TBD (to be determined)
- POE/CCA: TBD
- ACP: TBD
- Cost Review Board: TBD
- ASARC: TBD
- DAB: TBD

Current Status/Issues

Initial Operational Test and Evaluation 4QFY05

USAEC Role

Member of the R&R, CRB-WG, and T&E Integrated Process Team attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

Longbow Hellfire (LBHF)

System Description

The Longbow Hellfire missile (L-Model) is a fire-and-forget version of the Hellfire missile that uses radar-aided inertial guidance. It is part of the AH-64D Longbow Apache attack helicopter system that includes mast-mounted fire control radar (FCR) and a launcher. The Longbow FCR will locate, classify, and prioritize targets for the Longbow Hellfire missile. The Longbow Hellfire missile incorporates a Ka-band-millimeter-wave radar seeker on a Hellfire II missile aft-section bus. The primary advantage of the Longbow missile includes:

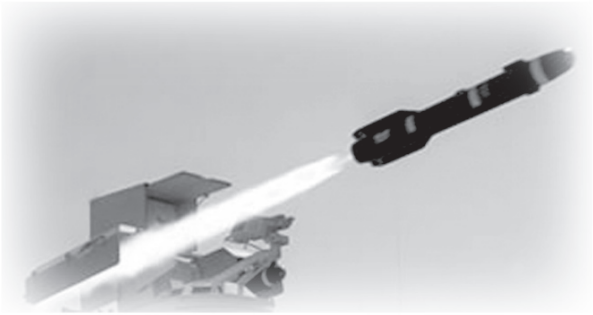
- Advance weather capability (rain, snow, fog, smoke, and battlefield obscurant)
- Millimeter-wave countermeasures survivability
- Fire-and-forget guidance that allows the Apache to launch and then immediately remask, minimizing exposure to enemy fire
- An advance warhead capable of defeating all projected armor threats into the 21st century
- Reprogrammability to adapt to changing threats and mission requirements
- The combination of Longbow Hellfire's fire-and-forget capability and Hellfire II's semi-active laser precision guidance will provide the battlefield commander with flexibility across a wide range of mission scenarios. This permits fast battlefield response and high mobility not afforded by other anti-armor weapons.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: N/A
- Current Phase: Fielded
- System Lead: Army

Upcoming Major System Reviews

None planned.



Current Status/Issues

Monitoring for system upgrades.

USAEC Role

Member of the R&R, CRB-WG and T&E Integrated Process Teams attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

Multiple Launch Rocket System (MLRS)

System Description

The Extended Range Multiple Launch Rocket System (ER-MLRS) is an all-weather unguided ballistic flight rocket designed to engage targets out to a range of 45 Km. Compared to M26, the ER-MLRS has a lengthened rocket motor and smaller warhead section with fewer submunitions. M26A1 version has submunitions equipped with a self-destruct fuze to reduce hazardous duds for improved maneuver force safety. M26A2 has M77 submunitions (currently found in the M26 basic rockets). ER-MLRS was procured in very limited quantities.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket & Missile Systems
- Acquisition Category: III
- Current Phase: LRIP 5
- System Lead: Army

Upcoming Major System Reviews

- Full Rate Production 2QFY05

Current Status/Issues

The system upgrade is the GMLRS.

USAEC Role

Member of the R&R, CRB-WG and T&E Integrated Process Team attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

Non-Line of Sight-Launch System (NLOS-LS)

System Description

The Non-Line of Sight-Launch System (NLOS-LS), a core system within the FCS, consists of a pair of precision-guided missile types loaded into a highly deployable, platform-independent Container Launch Unit (CLU) with self-contained technical fire control, electronics, and software for remote and unmanned fire support operations.

The NLOS-LS CLU will contain a total of 15 missiles and will launch Precision Attack Missiles (PAMs) focused on defeating hard targets and Loitering Attack Missiles (LAMs) against fleeing, high-value targets. The LAM will also search, survey targets, verify and assess battle damage, and serve as an airborne radio transmission platform for other Future Combat Systems (FCS). Either a PAM and/or LAM will automatically launch vertically from the CLU when fire mission orders are received via the FCS init of action network. Each missile will be responsive to in-flight target updates via an on-board Joint Tactical Radio Set Cluster 5 radio, and will possess limited automatic target recognition capability. Both PAM and LAM will possess multi-capable warheads effective against both armored and soft targets. Future missiles in the follow-on FCS increments may include air defense and non-lethal capabilities.

System Data

Key FCS NLOS-LS advantages include:

- Real-time battlefield surveillance
- Remote fire control
- Remote replacement
- Enabling extended-range target engagements and battle damage assessment
- Jam-resistant Global Positioning System

Upcoming Major System Reviews

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: : II
- Current Phase: MS B
- System Lead: Army

- ASARC March 2008

Current Status/Issues

An update to MS B is expected in November 2004 that will address the required documentation in greater detail. MS C is scheduled for March 2008

USAEC Role

Member of the R&R, CRB-WG and T&E Integrated Process Teams attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

SURFACE LAUNCHED ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE

SYSTEM DESCRIPTION

The Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM) is a lightweight, day or night, limited adverse weather, beyond-line-of-sight/non-line-of-sight (BLOS/NLOS) fire unit for countering low altitude rotary wing (RW), fixed wing (FW), cruise missile (CM), unmanned aerial vehicle (UAV), unmanned combat aerial vehicles (UCAVs), and Reconnaissance, Surveillance, and Target Acquisition (RSTA) platforms. SLAMRAAM utilizes Sentinel Radar, and the AIM-120C Advanced Medium Range Air-to-Air Missile (AMRAAM), to provide capability Air Defense to Short-Range Air Defense (SHORAD) elements. It supports blue sky and background clutter engagements in close combat areas where maneuvering forces and their supporting units operate. The SLAMRAAM force protection mission is to engage low-altitude aerial threats within the kinematic range of AMRAAM, in the ground-launched mode. It uses the Forward Area Air Defense (FAAD) Command and Control (C2) to interface with legacy SHORAD elements. The SLAMRAAM Fire Unit is a platform consisting of a basic load of four to six AMRAAMs, a High Mobility Multi-Purpose Wheeled Vehicle (HMMWV), rotatable launch rails, launcher electronics, and on-board Battle Management Command, Control, Communications, Computers, and Intelligence (BMC4I) components. The SLAMRAAM System will include an Integrated Fire Control Station (IFCS) as the primary BMC4I node between the fire units and the sensors and legacy force. The IFCSs will be located at the platoon, battery, and battalion command levels.

SYSTEM DATA

- PEO: Missiles and Space (formerly Tactical Missiles)
- P0: Cruise Missile Defense Systems
- Acquisition Category: II
- Current Phase: System Development and Demonstration
- System Lead: Army

UPCOMING MAJOR SYSTEM REVIEWS

- CARD: TBD (to be determined)
- POE/CCA: TBD
- ACP: TBD
- Cost Review Board: TBD
- ASARC: TBD
- DAB: TBD

CURRENT STATUS/ISSUES

On 16 Sept. 2003, SLAMRAAM received Milestone B approval from the Army Acquisition Executive. SLAMRAAM is currently in the System Development and Demonstration phase and continues to cooperate with the USAEC. There are no issues.

USAEC Role

USAEC performs independent Environmental Quality Impact analyses and cost analyses for the Deputy Assistant Secretary of the Army (Installations and Environment) to ensure Army weapon system programs meet requisite environmental criteria prior to milestone reviews.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6853 (DSN 584).

Tube-Launched, Optically Tracked, Wire-Guided Bunker Buster Missile (TOW Bunker Buster)

System Description

The TOW (tube-launched, optically tracked, wire-guided) Bunker Buster Missile System incorporates a newly developed warhead onto the exciting, reliable TOW 2A missile airframe. The TOW BB missile provides a precision-guided capability to breach eight-inch thick, double concrete walls, and provide a structural overmatch against earth and timber field fortifications.

TOW BB is a heavy, precision-guided, anti-fortification and breaching weapon system, consisting of a launcher and missile. The gunner defines the aim point by maintaining the sight crosshairs on the target. The launcher automatically steers the missile along the line-of-sight toward the aim point via a pair of control wires that physically link the missile and the launcher. The missile impact is at the charge glove and a pyrotechnic detonation delay to enhance warhead effectiveness.

TOW BB is optimized for performance against urban structures, earthen bunkers, field fortifications, and light-skinned Armor threats. TOW BB has a 6.25-pound, six-inch diameter high explosive, bulk charge warhead. The PBXN-109 explosive is housed in a thick casing for maximum performance, and the missile is fired directly from the case. The range is 65 to 3,750 meters. The TOW BB missile, weighing 45.2 pounds, is nominally six inches in diameter and 49 inches in length. Encased, the missile weighs 62.5 pounds, and the diameter is 8.6 inches. The missile has 91 percent reliability and a shelf life of 17 years.

TOW BB fits all launcher and stowage racks currently in the inventory and, for fire, requires no modification to the current TOW platforms. The TOW BB missile is fired from a Stryker Anti-Tank Guided Missile Vehicle or a Bradley Fighting Vehicle.

System Data

- PEO: Missiles and Space (formerly Tactical Missiles)
- Project Office: Precision Fires Rocket and Missile Systems
- Acquisition Category: : II
- Current Phase: Fielded
- System Lead: Army

Upcoming Major System Reviews

- CARD: TBD (to be determined)
- POE/CCA: TBD
- ACP: TBD
- Cost Review Board: TBD
- ASARC: TBD
- DAB: TBD

Current Status/Issues

A modified TOW 2B with aero modifications is currently being fielded during FY04-FY09.

USAEC Role

Member of the R&R, CRB-WG and T&E Integrated Process Team attending meetings and reviewing documents and providing comments, notebooks, etc.

Weapons System Points of Contact (PM office and USAEC)

USAEC: (410) 436-6842.

ADVANCED CREW SERVED WEAPON

SYSTEM DESCRIPTION

The ACSW is an Acquisition Category (ACAT) II program with a Milestone B review scheduled for the end of 2QFY04. Attainment of this milestone will allow the spiral development program to proceed into Increment I System Development and Demonstration (SDD) to ensure a producible, supportable, and cost-effective design. Prototype demonstrations and early operational assessments take place, followed by Milestone C in 4QFY07, and initiation of Low Rate Initial Production (LRIP). After Initial Operational Test and Evaluation (IOT&E) of the LRIP hardware, a Full Rate Production Decision Review will be held prior to proceeding to Full Rate Production in FY10. Increment II SDD starts in FY10 with a Milestone B (II) decision and runs through to Milestone C (II) in FY13.

The 25 mm XM307 will displace selected MK19 40 mm Grenade Machine Guns, and the XM312 .50-Caliber will displace selected M2-.50 caliber Heavy Machine Guns. The XM307 is the most likely candidate to meet the Common Close Support Weapon requirement for six of the eight manned ground vehicles for Future Combat Systems (FCS). It is expected to be employed as the primary defensive armament for Combat, Combat Support, and Combat Service Support units as well as on the Future Tactical Truck Systems.

The XM307 System will integrate cutting-edge technologies to include the lethality of a 25 mm air-bursting munition, a 25 mm Armor Piercing (AP) munition, and an integrated, full solution, target acquisition/fire control system (TA/FCS), to provide decisively violent and suppressive target effects and a leap ahead in crew-served weapons performance. The TA/FCS will incorporate a laser rangefinder, ballistic computer, direct optics, video sight, electronic compass, thermal capability, motion tracker, Combat Identification for the Dismounted Soldier (CIDDS), and Modular Integrated Laser Engagement System (MILES). The XM307 System will include High Explosive Air Burst (HEAB) munitions capable of defeating not only exposed targets, but also those in defilade (targets that have taken cover behind structures, terrain features and/or vehicles). The XM307 will defeat light and lightly armored vehicles beyond one kilometer with its armor-piercing warhead, provide a heavy machine gun capability in a medium machine gun package, and employable as vehicle mounted or tripod mounted for ground applications.

The XM307/312 Advanced Crew Served Weapon will be initially fielded to Fort Benning, Ga., and Fort Knox, Ky. When fielding is complete, the systems will be fielded throughout the Army, CONUS, and OCONUS.

SYSTEM DATA

- PEO: Soldier
- PM: Advanced Crew Served Weapon
- Acquisition Category: ACAT IC
- Current Phase: Milestone B
- System Lead: Army

Upcoming Major System Reviews

- Cost Review Board: TBD (to be determined)
- ASARC: TBD
- DAB: TBD

Current Status/Issues

The System Development and Demonstration contract was awarded to General Dynamics in April 2004. USAEC prepared an Environmental Quality Life Cycle Cost Estimate (EQLCCE). USAEC has prepared an ASARC briefing notebook for ASA (ESOH). USAEC has recently reviewed and provided comments on the PESHE, ORD, and the TEMP.

USAEC Role

USAEC prepared an Environmental Quality Life Cycle Cost Estimate (EQLCCE) and is an active member of the Cost Working-Level Integrated Product Team.

Weapons System Points of Contact (PM office and USAEC)

PM Soldier: Picatinny, N.J., (973) 724-4042.

Land Warrior Infantry System

System Description

The Land Warrior Infantry (LW) System enhances the lethality, battle-command compatibility, survivability, mobility, and sustainability of dismounted combat soldiers, enabling them to engage and defeat enemy targets, while minimizing friendly casualties. The LW System is modular, to permit tailoring for mission requirements, minimize the combat load, and facilitate maintenance. LW facilitates command, control, and sharing of battlefield information, thus providing "total battlefield visibility" and integration into the digitized battlefield.

The system integrates previously distinct components such as protective clothing, communications, sensors, and power, thereby adding enhanced capabilities without adding weight. The LW system includes weapons, sensors, laser rangefinder, displays, integrated load-carrying equipment with ballistic protection, protective clothing, helmet, speaker, microphone, computer, navigation, radio, and controls, with a consistent and intuitive interface for use under battlefield conditions. These components are integrated into a system that enhances the dismounted combat soldier's lethality, survivability, mobility, command-control-communications, situational awareness and sustainability.

Lethality: LW will increase dismounted soldier lethality by providing an improved capability to detect, acquire, identify, locate, and engage targets at greater ranges in all visibility conditions. LW fire control devices will allow the soldier to engage targets quicker with more accurate direct and indirect fires.

Command and control: LW will increase the dismounted leader's command and control capabilities by providing an integrated radio/computer/

Global Positioning System (GPS) with software and an integrated display that links the soldier to the digitized battlefield. Information collection and dissemination throughout the chain-of-command will be enhanced through real-time voice and digital reporting and still frame video transmission and capture.

Survivability: LW increases soldier survivability through improved situational awareness, improved body armor, laser detectors, improved chemical protection, and ballistic/laser eye protection. Survivability will also be increased as a result of the LW soldier's ability to engage the enemy with only his hands and arms exposed, through the integration of the thermal weapon sight and daylight video sight with the modular weapon and head-mounted display.

Mobility: LW increases soldier mobility by providing improved situational awareness, navigation/location support, and better load-carrying capability.

Sustainment: A digital reporting capability will enhance re-supply capabilities and increase unit effectiveness. Additionally, Government Furnished Equipment (GFE) has been integrated into the LW system to enhance repair parts commonality and reduce the logistics burden. Power management techniques are also included in the LW system to reduce battery consumption.

System Data

- PEO: Soldier
- PM: Soldier Warrior
- Acquisition Category: ACAT IC
- Current Phase: B
- System Lead: Army

Upcoming Major System Reviews

- AAE IPR: 15 Nov. 2002
- CRB: August 2003
- ACP approved October 2003
- ASARC: September 2004; ASARC Milestone C Decision 4th Quarter 2005
- DAB: (To be determined)

Current Status/Issues

- No environmental issues currently associated with LW.
- The LW program is currently preparing for an ASARC for Soldier as a System IPR on 28 Sept. 2004.
- ASARC will review Soldier as a System to include Soldier Weapon, Soldier Equipment, Air Warrior, and Mounted Warrior Programs.
- Soldier as a System scope, funding, and scheduling are the primary focus.
- USAEC is monitoring the development of the LM145 battery.

USAEC Role

Member of the Cost Integrated Process Team (IPT). Advisory member for the CRB and ASARC Reviews. The Cost IPT reconvened in April 2002. The Army Cost Position (ACP) was approved in October 2003. Environmental costs (i.e., battery disposal issues, computer disposal/demilitarization issues, disposal

of radios, and laser components, etc.) have been identified in the Environmental Quality Life Cycle Cost Estimate (EQLCCE) and as part of the POE. The EQLCCE includes disposal costs for all hardware purchased. The LW EQLCCE used an analogy to the WIN-T disposal estimate. USAEC has reviewed and provided comments on the LW ORD, and attended the Council of Colonels in March 2004 to review for the upcoming Design Readiness Review in November 2004. USAEC is monitoring the development of the LM145 battery.

Weapons System Points of Contact (PM office and USAEC)

PM Soldier: (703) 704-3860.

ASA (ALT): (703) 604-7151.

XM8

System Description

XM8 features a short piston stroke, gas-operated action, with rotating bolt locking. Barrels are quick detachable, and planned to be available in several sizes, ranging from 229 mm (9.5 inch) for the Compact version, 318 mm (12.5 inch) in the basic version, and a 508 mm (20 in) barrel, for the Designated Marksman version. The entire construction is modular and built around the polymer receiver with bolt group; magazine housings could be easily swapped for compatibility with various types of magazines; various butt stocks could be installed in a second for various roles (standard butt stock is a telescoped, five position adjustable one). The top of the receiver is fitted with proprietary sight rail, which can accept illuminated red-dot (collimator) sight, or any other type of sighting equipment. The detachable forend will be available in various sizes, and could be replaced with XM320 40 mm grenade launcher (the improved HK AG36). Ambidextrous fire controls mounted on the trigger unit, integral with pistol grip, trigger guard, and in basic configuration, are planned to deliver single shots and full automatic fire.

This modularity includes the exchange of interchangeable assembly groups such as the barrel, hand guard, lower receiver, butt stock modules, and sighting system, with removable carrying handle. The unique butt stock system allows an operator without tools to exchange butt stocks from the standard collapsible multi-position version to an optional butt cap for maximum portability, or to an optional folding or sniper butt stock with adjustable cheek piece for special applications. Internally the XM8 employs a combat-proven robust rotary locking bolt system that functions and fieldstrips similar to the current M16 rifle and M4 carbine. However, this bolt is powered by a unique gas operating system that employs a user-removable gas piston and pusher rod, to operate the mechanism. Unlike the current M4/M16 direct gas system with gas tube, the XM8 gas system does not introduce propellant gases and the associated carbon fouling, back into the weapon's receiver during firing. This greatly increases the reliability of the XM8 while reducing operator-cleaning time by as much as 70 percent. This system also allows the weapon to fire more than 15,000 rounds without lubrication or cleaning, even in the worst operational environments. A cold hammer-forged barrel will guarantee a minimum of 20,000 rounds of service

life and ultimate operator safety, in the event of an obstructed bore occurrence.

The XM8 has fully ambidextrous operating controls to include a centrally located charging handle that doubles as an ambidextrous forward assist when required, ambidextrous magazine release, bolt catch, safety/selector lever with semi and full automatic modes of fire, and release lever for the multiple position collapsible butt stock. The operating controls allow the operator to keep the firing hand on the pistol grip and the weapon in the firing position at all times while the non-firing hand actuates the charging handle and magazine during loading and clearing. Major components of the weapon are produced from high-strength, fiber-reinforced polymer materials that can be molded into nearly any color, including OD green, desert tan, arctic white, urban blue, brown, and basic black. Surfaces on the XM8 that interface with the operator are fitted with non-slip materials to increase comfort and operator retention. The XM8 uses 10 or 30-round semi-transparent box magazines and high-reliability 100-round drum magazines, for sustained fire applications.

System Data

- PEO: Soldier
- PM: Individual Weapons
- Acquisition Category: II
- Current Phase: System Development and Demonstration
- System Lead: Army

Upcoming Major System Reviews

- Cost Review Board: 4th QTR 2004
- ASARC: 4th QTR 2004 (ASARC IPR)
- DAB: 4th QTR 2004

Current Status/Issues

The program is preparing a Program Office Estimate and USAEC is preparing an Environmental Life Cycle Cost Estimate projected for completion 01 Apr. 2005.

USAEC Role

USAEC is currently preparing an Environmental Quality Life Cycle Cost Estimate. An Environmental Quality Initial Assessmant is prepared by the U.S. Army Environmental Center (USAEC) prior to major Milestone reviews. An EQIA is comprised of a review of pertinent program documents and requires coordination with the weapon system ESOH POCs to confirm all applicable information.

Weapons System Points of Contact (PM office and USAEC)

PM Soldier: (973) 724-8515.
USAEC: (410) 436-6851.

Technology Branch

ARMY SUSTAINABILITY VIDEO

PURPOSE

The Sustainability Video is a complement to a series of other concurrent Army efforts aimed at helping support education, awareness, and support for the implementation of sustainable practices throughout the Army. Sustainability is the foundation for the recently released Army Strategy for the Environment.

BENEFITS

The video promotes awareness of installation sustainability, so that it can be integrated into all functional areas throughout the Army. Sustainability ensures that today's operations will not impede the operations of Soldiers tomorrow and in future generations. It is about helping Soldiers perform their mission and maintain readiness in the most efficient and effective manner possible.

TECHNOLOGY USERS

Users of this product include Headquarters, Department of the Army (HQDA) management and installation personnel, especially Army strategic and master planners. The broader audience also includes members of the public, non-governmental organizations, regulators, Congress, and environmental groups.

DESCRIPTION

USAEC will use the Army Multimedia and Visual Information Directorate to award and oversee development of the sustainability video. Two separate videos for two separate audiences will be produced, with a combined duration of 20 minutes.

The first video will be titled, *"Army Leadership — Sustain the Mission for a Secure Future,"* and will be designed to promote sustainability among senior HQDA personnel, officers, and staff, with a focus on Army strategic and master planners. While the public is not the main audience, they are not precluded from viewing the video. The key points to be communicated are the definition of sustainability, in that it ensures today's operations will not impede the operations of Soldiers tomorrow and in future generations. It is about helping Soldiers perform their mission and maintain readiness in the most efficient and effective manner possible. The video will stress that sustainability is a concept and can be described as a 'journey.' It is not a program and it is not only an environmental responsibility. It will be shown that corporate leaders in the private sector have embraced sustainability.

The second video will be titled, *"Installations — Sustain the Mission for a Secure Future,* and will develop an awareness of the concept of sustainability and an understanding of how it can be integrated into functional areas throughout the Army. The video will be designed for view by all levels of the Army, but will focus on lower-level management and installation personnel. Audiences will also include members of the public, non-governmental organizations, regulators, Congress, and environmental groups. The video will show that the Army is

committed to sustainability, and that while much work remains, progress is being made and positive things are happening at the installation level. The video will also focus on how an interested person can become involved in helping ensure sustainable practices throughout the Army.

Accomplishments and Results

The funds have been sent by military interdepartmental purchase request to the Army's JVIA Production Acquisition Division, to be awarded in FY04. The total project duration is expected to take approximately 12 months.

Program Partners

U.S. Army Environmental Center

Army Multimedia & Visual Information Directorate

Office of the Department of Environmental Programs for the Assistant Chief of Staff for Installation Management

Office of the Environmental Safety and Occupational Health for the Assistant Secretary of the Army for Installations and Environment

Fort Gordon Deconstruction Project

Purpose

The Fort Gordon, Georgia, program was devised to help the Army and Department of Defense achieve the objectives of Executive Order 13101, the Pollution Prevention Act of 1990, and Army measures of merit such as AR 200-1 and the new Army ASAI&E Strategy for the Environment. Since the Department of Defense and Congress identified military installations for closure and realignment, more opportunities for deconstruction are available and their solid waste issues are more apparent.

Benefits

Deconstruction reduces the overall life-cycle costs of base operations for building removal, and extends the life of landfills by reducing demolition debris. Deconstruction serves the public goodwill by providing lower cost building materials to the community while it supports job creation and economic development. Finally, it protects the natural environment by reducing the need for extraction of new resources, and combines the recovery of both quality and quantity of reusable and recyclable materials.

Technology Users

Army installations, installation communities, private and public organizations, and individuals.

Description

In April 2004, officials at Fort Gordon met with members of the Fort Gordon community and Army representatives, to gauge public interest in deconstruction and determine the feasibility of holding a public auction to sell the recycling rights to six World War II-era buildings. After the public meeting, Fort Gordon decided that instead of demolishing the buildings as scheduled, they would hold an auction for the recycling rights to several buildings on post. The military deconstruction auction program was pioneered by Fort Knox, Kentucky, and Fort Gordon modeled their auction after the Fort Knox program. An aggressive

marketing program advertised the program milestones in local newspapers, on television, and on the Internet.

Fort Gordon and the Georgia Department of Natural Resources offered deconstruction training in July, several days before the auction. Attendees were shown different techniques for dismantling buildings including how to salvage old wood and remove nails from boards. They also learned how to prepare a contract for deconstruction and how to market recycled materials. Training participants came from as far away as Greensboro, North Carolina, and Austin, Texas.

Fort Gordon held a public auction to sell the recycling rights to several WW II-era buildings in July 2004.

The recycling rights to four warehouses, a small shed, and a pole barn were sold to qualified members of the public for deconstruction. About 30 people gathered at Fort Gordon for the auction. All seven buildings sold for a total of $6,500. Buyers signed agreements covering safety requirements and deconstruction rules, with the Fort Gordon Installation Directorate Morale Welfare and Recreation Fund Recycle Program (DMWRFRP). All deconstruction was to be completed between August 1 and September 11, and each building required a $500 purchase deposit. Each buyer was required to remove a minimum of fifty percent of the original building material by weight, during the deconstruction phase. Data was collected throughout the deconstruction process to gauge the success of the program and make improvements on future auctions. All hazardous materials were removed from the buildings before deconstruction began. Reclaimed materials not sold go to Fort Gordon's Department of Morale, Welfare and Recreation, and they will deal with the remaining materials. Money collected at the public auction was given to the recycle program at Fort Gordon.

Fort Gordon held a second public auction in October 2004. At this auction, 20 buildings were sold. The highest price for an individual building was $4,200 and the total revenue was $13,450. The most successful deconstruction company from the first auction returned and bought seven more warehouses. Each buyer was required to sign an agreement and abide by rules very similar to the July auction.

Accomplishments and Results

The Fort Gordon Deconstruction Program served as a learning experience for Army leadership and installation personnel and should help installations complete similar projects in the future. The money made from the auctions goes to improve the recycle program at Fort Gordon. To date, two auctions have been held and an increase in government and community involvement has led to greater understanding of the benefits deconstruction and material recycling for the Army and local communities.

Follow-On Program Requirements

The Army has embraced the concept of sustainability in its newly released Strategy for the Environment. The vision of sustainability requires that we become systems thinkers if we are to benefit from the interrelationships of the triple bottom line of sustainability: mission, environment, and community.

The deconstruction work that was accomplished at Fort Gordon in 2004 represents one example of a more sustainable approach to accomplishing the mission of facility removal. There are many who continue to identify, evaluate, and help transfer these techniques throughout the rest of the Army.

Program Partners

Fort Gordon, Georgia
U.S. Army Environmental Center
Georgia P2AD
EPA Region 4
Augusta Chronicle
University of Florida School of Architecture
Florida Department of Environmental Protection

Publications

Not applicable.

Solid Waste Functional and Operational Analysis

Purpose

The Army must manage solid waste in a sustainable manner to ensure that the Soldier and the mission are fully supported through strategic planning, operational management, and tactical execution. Proper management of solid waste reduces costs to the Army, improves force protection, and ultimately increases operational readiness. The Army Environmental Center (USAEC) adopted the Joint Capabilities Integration and Development System (JCIDS) as the method for identifying Army Environmental Requirements. JCIDS develops new capabilities and solutions through changes in doctrine, organization, training, materiel, leadership and education, personnel, and/or facilities (DOTMLPF) in a single document titled the Functional and Operational Analysis (FOA). The results were prepared by USAEC on behalf of the Army Environmental Quality Technology (EQT) Program.

Benefits

The JCIDS process provides a fundamental shift from generating bottom-up, stovepiped, component-centric materiel approaches, to a more holistic approach that considers the most effective joint force capabilities and the integration of those capabilities early in the process. The JCIDS process analyzes operational requirements through a functional area analysis (FAA), determines where capability gaps exist in meeting the requirements through a functional needs analysis (FNA), proposes changes in order to meet the requirements through a functional solutions analysis (FSA), and develops an initial capabilities document to address materiel solutions. This functional and operational analysis (FOA) is a combination of the FAA, FSA, and FNA.

Technology Users

Installation community, policy makers, technology developers.

DESCRIPTION

The functional area analysis is the first step in JCIDS. It is the basis for the functional needs analysis (FNA) and functional solutions analysis (FSA). Together, the FAA, FNA, and FSA comprise the functional and operational analysis (FOA).

The FAA divides the Army Solid Waste program into four subject areas: residential, commercial, and industrial facilities; construction and demolition sites; operational areas; and medical facilities. The current practice for solid waste management is described for each subject area. The medical facilities area is not addressed in the FNA or FSA because they operate in a separate chain-of-command from the rest of the solid waste management programs. Operational requirements were identified for managing solid waste. Environmental laws and regulations, OSD policies and guidance, operational orders, and field doctrine establish the requirements. Current operational requirements include preventing pollution whenever feasible and diverting at least 40 percent of the solid waste stream away from landfills or incineration. Future operational requirements are established through environmental organizations, national security strategies, DoD and Army policies and guidance, and focus on the implementation of environmental management systems and sustainability.

The FNA is the core of the JCIDS Process. It identified capability gaps, operational risks, and needs, grouped by subject area. In garrison operations, there is a capability gap between the operational requirements established in the laws, regulations, policies, and guidance, and the Army's ability to perform them. This is due to inefficient education and communication within the Army solid waste community, lack of command emphasis in both the major command (MACOM) and solid waste management chains of command, and lack of an Army-wide integrated solid waste management strategy. Another capability gap is the lack of in-place doctrine, guidance, and materiel to adequately support CONOPS solid waste management in every potential theater of operation in a timely fashion. This gap exists in current operations and will exist once the Army has undergone transformation. These gaps create operational risks to funding, force protection, and overall mission readiness – issues that are critical to national security and defense. The FNA identified 28 needs for closing the capability caps between current abilities and operational requirements.

The FSA is the final step in the FOA. It proposes 74 DOTMLPF solutions to the two capability gaps identified in the FNA. The FSA does not attempt to prioritize or rank potential solutions. Some suggested solutions might address more than one need. No analysis is given to cost or ability to fund the suggested solutions. The intent of the FSA is to provide a large list of potential solutions for Army leadership to select from and prioritize during the post-independent analysis of this report.

ACCOMPLISHMENTS AND RESULTS

USAEC performed the FOA in close coordination with several offices within the Office of the Assistant Chief of Staff for Installation Management. During this process, more than 100 offices were contacted, and approximately 1000 comments were received from 32 representatives. The final FOA document defines the functional area, identifies capability gaps, operational risks, and needs grouped by subject area and proposes 74 DOTMLPF solutions.

Follow-On Program Requirements

Following this effort, Army leadership will perform a post-independent analysis of this report to prioritize the solutions and determine which offices will assume the responsibility of implementing the solutions. The Office of the Director of Environmental programs will staff the final report for implementation.

For materiel solutions, an initial capabilities document will be published that describes current capabilities for these solutions. The environmental technology requirement will be published that will be a basis for developing a research, development, testing, and engineering program for the materiel needs.

Program Partners

Installation Management Agency Headquarters

Office of the Director of Environmental Programs

US Army Environmental Center

Army Materiel Command

Office of the Assistant Chief of Staff for Installation Management

Functional and Operational Analysis of the United States Army Environmental Quality Technology Requirement for Solid Waste. U.S. Army Environmental Center. October 2004.

Sustainable Ranges

Best Management Practices for Small Arms Ranges

Bullets are often fragmented and pulverized upon impact with backstops, berms, or bullet traps located on the range. Lead is the primary soil contaminant of concern at small arms ranges. Antimony, copper, and zinc also contribute to soil contamination. As with most metals, lead, antimony, copper, and zinc tend to adhere to soil grains and organic material and remain "fixed" in shallow soils. The normal operation of a range can produce lead concentrations of several percent in soils located behind and adjacent to targets and impact berms. Range management practices need to be initiated to ensure that lead is not transported off range where it may trigger regulatory enforcement actions.

Purpose

Normal range use produces soil contaminated with metals from the spent rounds. This contamination has the potential to create environmental and occupational health problems during range operation and maintenance; however, proper management of ranges can alleviate these problems. Small arms range best management practices are being identified and demonstrated to support sustainment of small arms range activities.

Benefits

Cost-effective best management practices to ensure range sustainability while protecting human health and the environment.

Technology Users

Installation range managers.

Description

Lead accumulating in the environment as a result of an active small arms range does not alone constitute a problem. The determination of appropriate response actions at an active range should result from an assessment of the potential fate of the lead being placed on the range. The initial unit for assessment of small arms range areas is the watershed or sub-watershed scale. A firing range and its surrounding areas should be examined as a whole to identify potential effects and the contribution(s) each make to environmental concerns. Typically there is an entire series of complex of ranges near each other. The watershed scale of a range assessment takes into consideration the combined or cumulative effects of the entire range complex on the watershed(s) in which they lie.

The best management practices selected for an active range should be based upon the results of the range assessment of the potential fate of the lead being placed on the range. The practice(s) selected should be limited to the minimum required to address the operation, site-specific condition, range design feature, or maintenance procedure that most affects lead transport. These actions may involve the prevention of lead migration, pollution prevention, or lead removal methods.

Prevention of lead migration methods are typically the most cost-effective means of managing lead on small arms ranges. These methods consist of minor changes to range operation and maintenance methods, vegetative methods of controlling erosion, stormwater management methods, use of geosynthetic or erosion control materials, structural enhancements or modifications to impact berms, and soil amendments to promote chemical stabilization of the lead.

Accomplishments and Results

Draft Small Arms Range Best Management Practices (BMP) Guidance Manual

Design elements will be incorporated into Huntsville, TC-25-8, Standard Range Design Document.

Follow-On Program Requirements

Demonstration/validation of the U.S. Environmental Protection Agency Region 2's Best Management Practices for Lead at Outdoor Shooting Ranges, January 2001.

Program Partners

U.S. Army Environmental Center

U. S. Army Aberdeen Test Center

U.S. Army Corps of Engineers, Huntsville, U.S. Army Engineering and Support Center

U.S. Environmental Protection Agency, Region 2

Changing Dyes in Smokes

Regulatory enforcement of environmental laws and regulations continues to expand with regard to munitions production and military range operations. Particularly, a rapid trend has developed toward the increased accountability of the Department of Defense (DoD) for emissions from the use of munitions items during training and testing operations.

Purpose

In 1997, the need to quantify emissions resulting from munitions use and assess the risk to human health and the environment, was identified as a critical issue for the Army and other U.S. military services. Environmental Protection Agency Region I requested information on emissions and residues from the use of munitions at the Massachusetts Military Reservation (MMR). DoD was unable to provide the requested data and thus could not present a valid assessment of the impacts. Since that time, additional data requirements have evolved, such as Emergency Planning and Community Right-to-Know Act-Toxic Release Inventory (EPCRA-TRI) reporting.

In September 1997, the Chief of Staff of the Army directed the Assistant Chief of Staff for Installation Management (ACSIM) to establish a general officer steering committee to address the implications of restrictions on operations at MMR. The ACSIM directed and funded the U.S. Army Environmental Center (USAEC) to gather emissions data. The USAEC developed a comprehensive program to identify emissions resulting from range operations that involve weapons firing, smoke and pyrotechnic devices, and exploding ordnance, and to assess the environmental and health hazard impacts resulting from their use. In the execution of that program, it was determined that two of the colored signal smoke grenades contain and emit significant quantities of toxic smokes and dyes. These signaling items are critical to training and combat operations and provide a method to immediately cease operations in the event that safety issues or operational needs are identified. These dyes/smokes may present a risk to the Soldier, any nearby receptors, and to production and test personnel, as well. It is in the best interest of the Army and DoD to demonstrate and implement a material substitution for dyes and smokes in these specific munitions items.

Benefits

The substitution of sugar and the dyes in these two smoke grenades will complete efforts for the reduction of toxic materials from the signaling and smoke devices. This will provide reduced risk to Soldiers, the environment and surrounding communities. In addition, this will reduce the potential for restricted operations and fines and penalties associated with the impacts of these items. Training realism will be maintained due to the lessening of restrictions. This next generation of colored smokes, while having less impact on the environment, will also provide a very real training and operational capability to the Soldier.

Technology Users

Soldiers
Installations
Police
Department of Transportation

DESCRIPTION

Several alternative materials have been identified, and funding was obtained to validate the functional and operational capabilities of these items with the alternative (less toxic) dye and smoke materials.

ACCOMPLISHMENTS AND RESULTS

Test smoke grenades have been developed. During the testing, new techniques were developed and utilized that have reduced the cost of the production of these two smoke grenades. This was accomplished through the use of starter patches and material changes in the composition of the starter and smoke material that have made the production simpler and lowered the temperature of the burning materials, to keep them from flaming. Pilot and production quantities of the smoke grenades (red) have been produced that meet the technical needs but which may need the dye combination adjusted to meet the visual requirements of the military community. Pilot quantities of the smoke grenades (violet) have been produced that meet the technical and visual requirements of the military community. Final grenades, available in calendar year 2004, were tested under the emissions characterization program. Additional grenades are being made for toxicity testing to determine their toxicity in comparison to the grenades they are expected to replace.

LIMITATIONS

The new smoke grenades must meet standard military criteria. To complete the transition, the new smoke formulations must meet Soldiers Observer and Maintainer Test and Evaluation requirements. This requirement includes a color comparison, part of the Production Validation Test (PVT). The color comparison includes soldiers testing the items on the ground as well as helicopters flying overhead, to ensure that the color is accurate when viewed from the air. The actual PVT is a testing of the item that was produced outside the normal line type production. Upon completion of the environmental testing, an Inhalation and Toxicology testing or assessment occurs. After all of these have been completed, the Engineering Change Proposal (ECP) is submitted to the Configuration Control Board (CCB) for their review and approval. If the ECP is approved, the Material Change Approval is issued. Upon the change in formulation, a phased-in production occurs. The first article states that a large sample of the items is to be tested to ensure it can be made by line operators and function as intended. After this final testing, the material is released for full-scale production and use.

PROGRAM PARTNERS

Environmental Security Technology Certification Program

West Deseret Test Center, Dugway Proving Ground, Utah

Pine Bluff Arsenal, Arkansas

Edgewood Chemical and Biological Center, Aberdeen Proving Ground, Maryland

U.S. Environmental Protection Agency

PUBLICATIONS

Planned publications are:

Final Report of the Smoke and Dye Program

Cost and Performance Report for the Smoke and Dye Program

Emission Source Characterization Model (SCM)

Existing models for predicting emissions and transport from munitions detonation and burning do not make use of the measured emissions data for firing point (FP), exploding ordnance (EO), and smoke/pyrotechnics (SP) gathered from the testing at Dugway Proving Ground and the Aberdeen Test Center. As a result, current models present difficulties for accurately predicting volatile and semi-volatile emissions. The U.S. Army Environmental Center (USAEC) has teamed with Aerodyne Research, Inc. and received Strategic Environmental Research and Development Program funding (1) to improve the modeling of chemical emissions fate from munitions testing, use, and demilitarization by collecting, evaluating, warehousing, and publishing modeling source terms and (2) to use the source terms in an existing model. This project will not generate data but will use data generated by emissions testing and similar efforts at USAEC, from elsewhere within the Department of Defense (DoD), and from other databases. The source term data will be customized to a particular model but will also be available to any modelers upon request. The EPA (Office of Air Quality Planning and Standards, at Research Triangle Park) is a technical advisor for this effort to ensure the model will be accepted for use upon completion.

Purpose

The goals of the SCM are to understand and quantify the major chemical and physical processes in FP, EO, and SP munition items when they are functioning properly; develop an SCM for accurately predicting source terms resulting from the detonation of munitions, link the SCM output to appropriate fate and transport models, and validate the final transport SCM against real world scenarios. The SCM will also serve as a model to bridge a data gap between available emission data obtained from actual munition testing to those munition items that were not able to be tested. The SCM will allow modelers to determine what the levels of emissions are from various munition items with some level of certainty. To date, USAEC has tested and collected emission factor data for more than 140 FP, EO, and SP munition items as part of the Munitions Air Emissions Characterization Program, and is expected to test a total of 223 by the time testing is completed. However, the Army currently has more than 13,000 munition items in use. The SCM will serve as a model to fill the data gap between available emission data obtained from actual munition testing and those munition items that could not be tested.

Benefits

The SCM will allow DoD to have a predictive tool for emissions factor data from munitions with unavailable real-world data.

Technology Users

Installation personnel
Air modelers

Description

The SCM will allow modelers to determine with some level of certainty, the levels of emissions from various munition items.

Accomplishments and Results

The beta version of the model is available for use.

Limitations

The current model includes data from 14 emission events. Further validation will be required to ensure all emissions are accurately calculated.

Follow-On Program Requirements

Validation of the model using all 223 munitions to be quantified.

Program Partners

Aerodyne Research Inc.
Strategic Environmental Research and Development Program
Environmental Protection Agency

Emissions Health Risk Assessment and Fact Sheet Development

This project defines the ongoing effort by the U.S. Army Environmental Center and the U.S. Army Center for Health Promotion and Preventive Medicine's Environmental Health Risk Assessment Program, to evaluate potential risks to off-site residents living near Army training facilities.

Purpose

Health Risk Assessments provide potential human health effects data for off-site residents living near Army training facilities. All available data is used in an air model to provide chemical-specific air concentrations. The air model is first run by assuming hypothetically, that a person resides at a point 100 meters downwind from the source of the air emissions, unless there is documentation indicating other restrictions on residential locations exist. Then, these air concentrations are time adjusted and compared with health-based screening levels. If the initial assessment shows that potential health risks exist, the distance is increased and the assessment reevaluated until the ambient air concentrations are below the health-based screening levels. In most cases, the distance to the nearest resident is at least 1,000 meters away. However, the study conservatively uses a distance of 100 meters, as a first step.

Benefits

Potential risks to off-site residents near Army training facilities are determined from testing, using real-world emission factor data. Through conducting health risk assessments, it has been determined that there is minimal, if any, potential inhalation risk to off-site residents

Technology Users

Installation personnel
Air modelers
Risk assessors

Description

These assessments determine potential human health effects to off-site residents breathing air emissions from munitions used during training activities on Army installations.

Accomplishments and Results

More than 40 health risk assessments and fact sheets are available, and it is anticipated that 223 will be available within the next two years.

Limitations

The evaluation is limited to assessment of potential health risks from inhalation of air emissions that are released by the use of training munitions. Each munition is evaluated separately, with a typical use scenario provided. Also, since these studies are not modeled after any particular, existing training facility, conservative model input data is used to generate results generic enough to be applicable to most facilities using these munitions.

Follow-On Program Requirements

None.

Program Partners

U.S. Army Center for Health Promotion and Preventive Medicine
Environmental Protection Agency

ITRC Small Arms Range Training and Technology Transfer

The Interstate Technology Regulatory Council (ITRC) Small Arms Range Team (SMART) is in the process of completing a document titled "Environmental Management at Operational Outdoor Small Arms Firing Ranges." In an effort to transfer the small arms range best management practices expertise that the USAEC has developed over the last decade, the USAEC has participated in the development of this document, and incorporated Army information into the SMART document. The ITRC SMART team will use remote Internet training and classroom training, to transfer their efforts from the document stage to field-users of small arms range technologies. This effort covers training at four Army-attended conferences, specific locations to be determined. The ITRC will hold approximately four other classroom training sessions for the general public, at various environmental venues.

Purpose

The primary objective of this effort is to provide operational small arms range classroom training at Army-attended conferences.

Benefits

Lessons learned from many small arms range projects and best management plan efforts will be transferred to private ranges, state and federal regulators, as well as Department of Defense range managers and operators. Training will be at no cost to those attending, and will occur at conferences where those most likely to want the training are in attendance.

The effort leverages our in-house efforts and simultaneously encourages regulatory acceptance and technical training.

Technology Users

Range community

Regulators

Description

Training modules for Internet training are under development by the ITRC small arms range team, including USAEC. This module will be modified to suit on-site training at conferences where interpersonal interaction makes training more effective. This effort allows the Department of Defense (DoD) to ensure range managers have access to the on-site training available at heavily attended Army conferences. USAEC will ensure that the conferences will be geographically spread, to ensure the widest possible attendance. State regulators will also attend this training, so that the range community understands that any techniques they employ from the training automatically have a high degree of regulatory acceptance.

Accomplishments and Results

Internet training is nearly complete, as is the document from which training is derived.

Follow-On Program Requirements

- Training will occur in 2004 and 2005.

Program Partners

ODEP

USAEC

ITRC

Ordnance Emissions Characterization Program

Military installations need to characterize the emissions generated by munitions during training and testing activities. The Ordnance Emissions Characterization Program will provide the Army and Defense Department with data to help assess environmental impacts from munitions use, as well as to build various models and health and risk assessments.

Purpose

- To obtain data and identify models that quantify the emissions generated from munition items.
- To provide the U.S. Army with data to assess potential air emissions.
- To create defensible data to be used for fate, transport, and effect work.

Benefits

The data generated from this effort will help the Army and Army installations assess the environmental impacts of using munitions during training and testing operations. The emissions data can be used to feed various models (such as air, fate, and transport) and support the generation of health risk assessments. Installations can also use the data to meet Emergency Planning and Community Right-to-Know Act, or the Toxic Release Inventory reporting requirements. Environmental restrictions on training U.S. military personnel will be minimized, due to more scientific data. Future cleanup costs may be reduced. Furthermore, environmental stewardship shown will enhance both public image and trust.

Technology Users

Army and Department of Defense installations
U.S. Army Installations
U.S. Army Research Laboratory
U.S. Army Corps of Engineers – Waterways Experiment Station
National Guard Bureau

Description

The U.S. Army Environmental Center (USAEC) has developed a test program to identify and quantify emissions that result from weapons firing and from the use of pyrotechnic devices. The data to be gathered will provide information on the concentrations of emission products. The requirement for this information was identified as a result of the Administrative Order issued by the Environmental Protection Agency (EPA) Region I, which severely restricted training operations at the Massachusetts Military Reservation. The Army questioned the validity of the claims made by EPA Region I, but was unable to provide data regarding training range emissions and the fate and transport of those emissions in the environment. This test program is focused on obtaining and developing data so the Army will be have an incontrovertible case for the continuation of operations, or at least limit the breadth of restrictions to those activities that are, in fact, causing peril. The three distinct but related project areas to quantify emissions have been developed as follows:

1) Firing Point Emission Study

This effort will develop data on the emissions resulting from weapons firing at the firing position, and associated emissions factors. The focus of the effort will be to quantify the emissions, develop emissions factors, and evaluate the fate of emissions from representative U.S. Army weapon system ammunition classes. The data generated will support the U.S. Army and U.S. Army installations in assessing the environmental impact of weapons firing as a part of training and testing operations. Limited data exist on the emissions associated with weapons firing. Research efforts such as those conducted by IIT Research Institute on small caliber (5.56 mm) and large caliber (105 mm) were very limited in scope. A phased approach has been developed. Phase I will encompass a data search and analysis, test matrix and methodology development, model development, and an interim report. An important objective of Phase I will be to establish item similarities and data crossover so that the item test matrix and costs are minimized. Phase I was completed in October 1998. Phase II involves weapons firing at the Aberdeen Test Center, Aberdeen Proving Ground, Maryland, with sampling and analysis results used to develop emission factors for specific weapons systems and ammunition types.

2) Characterization of Smoke and Pyrotechnic Emissions

This effort will develop data on the emissions resulting from smoke grenades and flare use during training and testing. A phased approach will be used to accomplish this task. Phase I encompasses a comprehensive data search followed by Phase II, actual testing to develop data on the emissions resulting from smoke grenade and flare use. The emissions will be characterized in the Bang Box at Dugway Proving Ground, Utah, for various smoke grenades (colored and uncolored) and flare devices (colored and uncolored). Results from these characterization efforts then will be used to generate emission factors for the various items. The emission factors then can be used in conjunction with standard dispersion models, to estimate downwind concentrations and rates of deposition.

3) Exploding Ordnance Emissions

This effort identifies and evaluates the fate of explosive compounds in projectiles that have properly functioned during training and testing operations. Efforts will be focused to assess and document the completeness of reaction, and to quantify the emission residuals and byproducts from explosive detonation of military projectiles. The dispersal of the residuals and byproducts in air, soil, and water will be evaluated, as well as factors affecting their environmental degradation and transport. A phased approach is planned. Phase I efforts will consist of a significant data search and review, test matrix and methodology development, and model identification. One aspect of test methodology will be to assess the potential of using small-scale detonations that mimic much larger sized ordnance. It is envisioned that at least one full-scale detonation will be required, and those results will be used for verification of the test methodology. Phase II will provide for the actual testing and for the development of emission factors.

Phase III for all studies in this effort involves a comprehensive study of the environmental fate, and transport of the emission products in the environment.

For all of the emissions studies, it is known that in perfect combustion of an organic (carbon-containing) substance, only carbon dioxide and water are

created. However, because explosions and other types of combustion do not always take place under optimum conditions, and because there are other substances included in these items, researchers look for many other substances in addition to carbon dioxide and water. During testing, the item being evaluated is placed in the testing chamber, and the system used to collect the emissions from the ignition of the item is activated. Upon detonation, the emission products are collected through a vacuum system. The samples collected are then processed by chemists to determine amounts of any substances present. Chemists analyze the samples collected for more than 280 substances that can be byproducts of combustion. The airborne compounds sampled during these tests included total suspended particulate (TSP), particulate matter that was smaller than 10 microns and 2.5 microns, metals, volatile organic compounds, dioxins and furans, carbon monoxide, and similar compounds that might lead to public health concerns.

The tests were also videotaped with high-speed film, enabling researchers to review the video and measure the fire plumes and smoke patterns from the detonations. The temperature and velocity of the firing are also measured. The information obtained can be used by modelers to determine what is ultimately happening to the emissions and their effects, if any.

Accomplishments and Results

Testing of 173 items for emissions characterization was completed. Reports are being generated recording emission factors, actual concentrations, and analysis of emissions.

Forty-three health risk assessments and fact sheets have been produced based on the emission factors generated.

Publication of 10 munition items and their respective background documents, and AP-42 sections addressing the emission factors on EPA's Web site in the standard AP-42 document.

The EPA-Research Triangle Park (EPA-RTP) has been reviewing detailed test plans (DTPs) prior to the firing or detonating of the ordnance. EPA-RTP's comments and approval of the plans has added great validity to the testing.

- Complete at least 28 various tests in fiscal year 2005 at Dugway Proving Ground and the U.S. Army Aberdeen Test Center.
- Complete documents publishing emission factor results.
- Publish emission factors in the EPA's standard document (AP-42).
- Publish fact sheets and technical documents for each item tested (with descriptions of the item, its emissions, and a generic health risk assessment).

Program Partners

U.S. Army Environmental Center

U.S. Army Aberdeen Test Center

U.S. Army West Deseret Test Center, Dugway Proving Ground, Utah

Environmental Protection Agency

U.S. Army Center for Health Promotion and Preventive Medicine

Range and Munitions JCIDS Analysis

As part of the overall effort to re-evaluate Army environmental requirements identified within the Environmental Quality Technology Program, this effort assesses the area of ranges and munitions using a modified Joint Capabilities Integration and Development System (JCIDS) process (new instruction CJCSI 3170.01D, March 2004). Traditionally, JCIDS is used for hardware systems as a means to assess the need for new technology. In this case, the JCIDS process is used to document a Functional Area Analysis (FAA–task list and problem description), Functional Needs Analysis (FNA–parts of the task list not currently available), and a Functional Solutions Analysis (lists solutions for analysis to compare net costs and benefits).

Purpose

To evaluate the environmental impact of munitions use on operational Army ranges, with the end goal of listing and comparing various types of solutions (Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities), with materiel solutions as a last resort solution, if no other means appear feasible.

Benefits

There will be one place to see all the environmental regulatory and institutional requirements that installations need to operate and sustain the Army's rangelands. There will be one place to see where the Army lacks the necessary environmental means to sustain these rangelands. Finally, there will be one place to see the universe of potential solutions for these gaps, as well as a limited scope analysis of several of these solutions. Army planners and policy makers may use this documentation to focus resources on changes deemed necessary to support range sustainment.

Technology Users

Range community, policy makers, technology developers.

Description

We now have sufficient information about the environmental condition of our ranges to evaluate what creates the conditions (ordinance residue, erosion, encroachment) that may prevent the Army from training and testing at the necessary tempo. We use the JCIDS systematic process as a means to evaluate what changes, if any, to make to sustain Army testing and training ranges.

In the FAA, we state our objective: to identify and prioritize environmental issues impacting current and future training and testing ranges. Additionally, we evaluate the tasks necessary to meet that objective, including the supporting regulations to meet those tasks. In the FNA, we establish which of those tasks currently have sufficient information or resources to support sustainment, and identify which tasks have insufficient resources to meet the Army's range sustainment goal. The end result of the FNA is a list of the gaps where we have insufficient resources. Those gaps provide the basis for the FSA. The FSA will include a listing of potential solutions for each identified gap. There may be many solutions for each gap. We will analyze a few of the solutions in detail.

Accomplishments and Results

A draft FAA is complete (October 2004).

Follow-On Program Requirements

Complete combined FAA, FNA, and FSA.

Program Partners

ODEP
USAEC
Booz Allen Hamilton

Range Design Risk Assessment Model - EQT

Due to a significant growth in environmental regulations, Army ranges and training lands are increasingly impacted by environmental compliance requirements that affect the use and capabilities of ranges. A tool is required to permit early identification of environmental compliance issues affecting the design, construction, operation, maintenance, and closure of ranges. The product of this effort is a Range Risk Assessment Model (a tool) that provides the capability for early identification of environmental compliance issues that affect the design, construction, operation, maintenance, and closure of ranges.

Purpose

The purpose of this effort is to develop a matrix methodology to identify environmental compliance issues and other risk factors related to sustainable ranges, and to assist range managers in planning for and designing new ranges, and retrofitting existing ranges.

Benefits

The model being developed under this program will enable range managers and planners to more quickly identify and assess environmental compliance issues and other risk factors related to sustainable ranges, and in planning for and designing new ranges and retrofitting existing ranges. This will favorably impact budgeting and scheduling of range projects.

Technology Users

All installations will be able to use the model being developed under this program.

Description

The product of this effort is a tool that will provide for early identification of environmental compliance issues that affect the design, construction, operation, and maintenance and closure of ranges. It will enable range managers to focus time and resources, shorten the NEPA process, and reduce overall costs. The tool will "walk" users through the environmental issues and related risks related to range projects, as well as support the NEPA process. The tool will support assessment of existing ranges and support construction of new ranges. The tool will be computer-based, with a graphical user interface. It will have reference links to the Environmental Performance Assessment System, Range Munitions User Guide, and Web-based links to environmental modeling tools. Users will include all personnel with a role in the planning, design, construction, operation, maintenance, and closure of ranges.

The research and development phase has three elements: (1) develop a range environmental risk methodology, (2) qualify or quantify the environmental

compliance risk for individual ranges or a suite of range types, and (3) identify and incorporate into the model appropriate mitigation approaches and techniques to address risk.

Risk will be assessed in terms of significant environmental compliance risks now, or future risks anticipated as being associated with sustaining ranges and training activities.

The model will be developed in three phases, with each phase representing an interim product. The first phase will be a computer-based tool with an initial assessment methodology. This will provide an automated matrix that scores the probability of environmental compliance vulnerability for ranges. The second phase product will expand the analysis capability to include a spatially explicit analysis of regional and site-specific issues. The third phase product will include a numerical modeling capability that may be applied to site-specific factors.

Accomplishments and Results

The Construction Engineering Research Laboratory (CERL) recently completed the first phase (as described above).

Limitations

This model is intended to assist range managers; however, range managers will still need to consult with installation environmental personnel.

Follow-On Program Requirements

Demonstration and validation of the model likely will be performed beginning in early 2005; technology transfer to interested users likely will be accomplished in late 2005 or early 2006, by the U.S. Army Environmental Center.

Program Partners

U.S. Army Environmental Center

U.S. Army Engineer Research and Engineering Laboratory, Construction Engineering Research Laboratory

Army Training Support Center

Publications

Under development.

Range Design Specifications Incorporating Environmental Compliance - EQT

Due to significant growth in environmental regulations, Army ranges and training lands are increasingly impacted by environmental compliance requirements that affect the use and capabilities of ranges. Existing range design elements that contribute to environmental degradation and regulatory noncompliance need to be identified and assessed and improved designs developed, to mitigate future environmental degradation and potential regulatory noncompliance risk. This project analyzes range design elements with respect to mission, environmental degradation and regulatory noncompliance. The project will develop new designs and provide retrofit and upgrade packages for selected high-risk elements. The long-term operation and maintenance (O&M) requirements of existing designs, and their cost implications and impact on range down time, will also be assessed.

Purpose

The overall purpose of this effort is to (1) identify range design elements that pose an environmental compliance risk, and develop improved range design elements to mitigate that risk; (2) to demonstrate, validate, and document selected new and improved range design elements; and (3) to incorporate recommended technologies into standard range design criteria.

Benefits

The new range design elements being developed under this program will mitigate future environmental degradation and potential regulatory noncompliance risk.

Technology Users

All installations will be able to use the specifications, range retrofit packages, and design guides being developed.

Description

Engineering aspects of the new designs will be assessed and compared to existing designs according to cost, effectiveness, and O&M requirements, over the range life cycle. Several design criteria include: (1) must meet acceptable tactical standards, (2) should achieve 50 percent reduction in O&M costs, (3) reduce berm maintenance time intervals to 20-36 months, (4) more effectively capture munitions, and (5) identify optimal berm composition and design methods.

Products of this effort will be new designs that incorporate sustainable components and reduce the risk of range operations. Products will be in the form of evaluation reports and design packages to be incorporated into existing standard range design processes. Evaluation reports and design packages also will be provided as general guidance, for installation range managers use at the installation level, for planning and modification of operations associated with existing ranges.

The approach is: Existing environmental degradation and regulatory noncompliance data will be captured, along with design data relative to previous work on ranges. Design elements will then be assessed, and prioritized based on readiness requirements and common environmental degradation problems and noncompliance risks. Finally, improved range design elements, citing criteria, and upgrade packages for existing ranges, will be developed.

Accomplishments and Results

The Construction Engineering Research Laboratory is working to identify new major designs and design elements for demonstration and validation purposes. This effort is ongoing. The three major final products associated with this effort are (1) a report documenting development of range design retrofit and upgrade packages, (2) a final report detailing improvements to existing range design elements, and (3) an engineering cost assessment. It is intended that a minimum of five new major designs or design elements will be developed. As part of this program USAEC has completed a preliminary engineering and cost analysis of the following commercial off-the-shelf technologies: (1) Shock Absorbing Concrete (SACON) blast mat for use on tank defilade positions; 2) Camouflaged Erosion Control Mat (CAMO-MAT) for erosion control and slope stabilization; 3) articulating concrete block (cable concrete) for tank turn points and stream ford crossings; 4) rail tie mats for tank turn points and stream ford crossings; 5) oligosaccharide aldonic acids as a dust palliative.

Limitations

Limitations of the new range design elements and guidelines currently being developed have to be determined.

Follow-On Program Requirements

Demonstration and validation testing of selected range design elements will be performed beginning in early 2005; technology transfer to interested users will likely be accomplished in 2006 by the U.S. Army Environmental Center. New and improved range design elements must also be incorporated into standard range design criteria, and commercialization assessments of promising technologies still must be performed.

Program Partners

U.S. Army Environmental Center

U.S. Army Engineer Research and Engineering Laboratory, Cold Regions Research and Engineering Laboratory

U.S. Army Engineer Research and Engineering Laboratory, Construction Engineering Research Laboratory Army Training Support Center

Publications

Design specifications for new/improved range design elements are being developed at this time.

Range Munitions Carrying Capacity Model or ATTACC for Munitions (AFM) - EQT

Due to significant growth in environmental regulations, Army ranges and training lands are increasingly impacted by a diverse set of environmental compliance requirements that affect the use and capabilities of ranges. Characterization of environmental risk associated with munitions use on ranges is required to sustain mission operations on ranges. Range managers and planners must understand the current environmental risks and be able to assess future environmental risks, as a function of munitions use. The ability to project risk as a function of planned range use is critical, as it impacts documentation, justification, budgeting, and scheduling of range projects. Assessment of environmental risk to ranges from ongoing and future training and testing activities can be met through development of a munitions management and prediction tool.

Purpose

The purpose of this effort is to develop a munitions-based carrying capacity capability for ranges that is similar to the existing Army Training and Testing Area Carrying Capacity (ATTACC) methodology that addresses maneuver impacts on ranges. Some other objectives are to integrate the model with Integrated Training Area Management ATTACC methodology, so as to develop a capability to model the cumulative effects of range operations.

Benefits

The model being developed will enable range managers and planners to better assess current environmental risks and future environmental risks as a function of munitions use. In addition to being able to project risk as a function of planned range use, the tool will enable range managers to improve budgeting and scheduling of range projects.

Technology Users

All installations will be able to use the Range Munitions Carrying Capacity Model/AFM being developed under this program.

Description

The product of this effort will be a munitions-carrying capacity methodology that is able to predict the munitions-carrying capacity of a range, as a function of munitions type and quantity and existing environmental conditions associated with that range. Range use will be characterized using existing military data repositories, programs, and computer methods such as ATTACC and the Range Facility Management Support System (RFMSS). Munitions use will be defined by Standards in Training Commission requirements. The environmental condition of ranges will be based upon active and inactive range inventories and related environmental data sources. The potential effects of proposed range use activities will be predicted using existing munitions fate, effects, and transport models. The development approach is this: Initially, all available information related to munitions activity on ranges, and the potential for contamination of ranges, will be captured. The next step will be to develop a methodology to capture munitions use data, and translate that information into potential effects based on case studies and existing munitions effects, fate, and transport models. A test case model incorporating techniques to collect information

and predict outcome then will be developed for an installation. Finally, the technical validity of the model will be reviewed, and appropriate modifications made to accomplish integration with RFMSS and ATTACC process and methodologies. Stated more simply, to incorporate munitions activities into the ATTACC methodology, three components must be developed: 1) a munitions training load component, 2) a land condition measure component, and 3) a relationship between land condition and munitions training load.

Accomplishments and Results

The Construction Engineering Research Laboratory completed the first phase (as described above) of developing an ATTACC-like range munitions training load quantification methodology – the training load characterization. Development of the land condition measure component and land condition/munitions training load relationship methodology, is ongoing.

Limitations

The Range Munitions Carrying Capacity Model/AFM initially will be applicable only to training ranges.

Follow-On Program Requirements

Demonstration and validation of the model will likely be performed beginning in 2005; technology transfer to interested users will likely be accomplished in late 2005/early 2006 by the U.S. Army Environmental Center.

Program Partners

U.S. Army Environmental Center

U.S. Army Engineer Research and Engineering Laboratory, Construction Engineering Research Laboratory

Army Training Support Center

Publications

ATTACC-Like Range Munitions Training Load Quantification Methodology – Phase I, Final Report, dated April 20, 2004, CALIBRE with the Construction Engineering Research Laboratory

Replacing Perchlorate in Simulators

Regulatory enforcement of environmental laws and regulations continues to expand with regard to munitions production and military range operations. Particularly, a rapid trend has developed toward the increased accountability of the Department of Defense (DoD) for the emissions resulting from the use of munitions items during training and testing operations.

Purpose

In 1997, the need to quantify the emissions resulting from munitions use, and to assess the risk to human health and the environment from these emissions, was identified as a critical issue for the U.S. Army and the other services. Environmental Protection Agency Region I requested information on the emissions and residues from the use of munitions at the Massachusetts Military Reservation (MMR). DoD was unable to provide the requested data and could not present a valid assessment of the impacts from munitions use at MMR. Since that time, additional data requirements, such as Emergency Planning and Community Right-to-Know Act, and Toxic Release Inventory reporting have evolved.

In September 1997, the Chief of Staff of the Army directed the Assistant Chief of Staff for Installation Management (ACSIM) to establish a general officer steering committee to address the implications of the restrictions on operations at MMR. The ACSIM directed and funded the U.S. Army Environmental Center (USAEC) to gather emissions data. The USAEC has developed a comprehensive program to identify the emissions resulting from range operations that involve weapons firing, smoke and pyrotechnic devices, and exploding ordnance, and to assess the environmental and health hazard impacts resulting from their use. In the execution of that program, it was identified that two of the simulators (containing perchlorate) were being used in significant quantities. These training items are critical to training and enhance the performance of Soldiers in combat operations and provide a method to train Soldiers for combat operations. Perchlorates move very quickly into ground water and are suspected of health effects that may present a risk to the Soldier or anyone drinking the water. It is in the best interest of the Army and DoD to demonstrate and implement a material substitution for the perchlorate in these specific munitions items.

Benefits

The replacement of the perchlorate in these two training devices will encourage efforts to find substitute materials for the elimination of perchlorate in other devices. This will provide reduced risk to Soldiers, the environment, and surrounding communities. In addition, this will reduce the potential for restricted operations and for fines and penalties associated with the impacts of these items. Training realism will be maintained due to the lessening of restrictions. This next generation of simulators, while having less impact on the environment, will also provide a very real training capability for the Soldier.

Technology Users

Soldiers
Installations

Description

Several alternative materials have been identified, but funding is required to validate the functional and operational capabilities of these items with the alternative (less toxic) materials, prior to implementation.

Accomplishments and Results

Test simulators have been developed. During the testing, new techniques were developed and utilized that have identified the requirements for these training devices for future evaluations. This was accomplished through the use of sound and visual recording devices that allowed the accurate measurements of the sound and flash from the original devices for comparison with the experimental devices. Pilot quantities of the two simulators have been produced that meet the technical needs. Final simulators will be available in calendar year 2004 and will be tested under the emissions characterization program. Additional simulators will be made for toxicity testing to determine their toxicity in comparison to the simulators they are expected to replace.

Limitations

The new simulators must meet military standard criteria. To complete the transition, the new simulator formulations must meet an Environmental Fate Assessment. Upon completion of the environmental testing, an inhalation and toxicology testing/assessment occurs. After all of these have been completed, the Engineering Change Proposal (ECP) is submitted to the Configuration Control Board, for their review and approval. If the ECP is approved, the Material Change Approval is issued. Upon the change in formulation, a phased-in production occurs. The first article test requires that a large sample of the items be tested, to ensure they can be made by line operators and function as intended. After final testing, the material is released for full-scale production and use.

Program Partners

Edgewood Chemical and Biological Center

Army Research and Development Center, Picatinny Arsenal, New Jersey

US Army Environmental Center

Publications

Planned publication is the final report on the replacement of perchlorate in the M115A1 and M116A2 simulators.

Tools for Monitoring Range Access - EQT

Increasing urban encroachment and the rise of international terrorism have resulted in an increased need for intrusion detection systems (IDS) on Army ranges. Minimizing unauthorized intrusion on Army ranges requires detection and deterrence of intruders. This can be attempted on a range-wide scale by lining the range perimeter with IDS sensors and cameras, or on a local scale to protect specific sites on a range. Selection of security equipment depends on which approach is to be implemented, and specific on-site factors such as terrain, weather, and existing infrastructure. The success of either approach in preventing injury, damage, or theft will depend on the response time of military police after being alerted that an intruder has been detected. IDS technologies must 1) be cost effective and require minimum Army personnel interaction, 2) not impact training requirements, 3) be able to discriminate between human and animal intrusion, 4) meet DoD and Army requirements for range access and control, and 5) be incorporated into standard range designs manuals and specifications.

Purpose

The overall purpose of this effort is to 1) identify, evaluate, and document existing government and commercial surveillance and monitoring technologies for their applicability to range access security, 2) to provide tools that will aid installations in acquiring the needed protection, and 3) to incorporate recommended technologies into standard range design criteria. The immediate goals are to 1) develop and demonstrate IDS Decision Tree software, and 2) develop and demonstrate an IDS GIS line-of-sight software tool.

Benefits

This program will help ensure increased force protection levels, and will assist installations in the procurement and preliminary design of IDS. The tools currently being developed and demonstrated under this program will allow range managers to quickly download select applicable IDS technologies from the wide array of technologies available, and will enable them to more easily estimate the number of IDS sensors required and the best location for these sensors.

Technology Users

All installations can use the tools being developed; the tools can easily be applied by installation personnel, provided the necessary computer hardware, software, and requisite GIS data are available.

Description

The Security Technology Decision Tree Tool (STDTT) currently being developed will allow installation personnel to identify quickly the type of IDS best suited for their needs, based on site-specific conditions. The Training Land (TL)-See GIS Tool being developed will assist users in placing cameras or line-of-sight IDS. The user will specify camera height, camera format, and lens (both selected from menu), and whether the potential target is upright or crawling. The user will set a camera location and a target location by clicking the mouse. The tool will consider topography and vegetation in calculating view shed, and display effective camera coverage between camera and target as a green overlay on a site image. Blocked areas will be in red. The tool will allow the user to do "what if" planning of camera placements, for security.

Accomplishments and Results

The Cold Regions Research and Engineering Laboratory (CRREL) has built an information database of IDS technologies and their capabilities and cost. CRREL also has invited demonstration of technologies for evaluation purposes, and evaluated technologies according to applicability to Army range needs and requirements. They have documented technologies that meet requirements. A report evaluating commercial and government IDS that are applicable to ranges was published in September 2003. The report outlines options for detecting intrusion using commercial off-the-shelf and government off-the-shelf equipment for both detection and surveillance assessment. It provides guidance to assist range managers in selecting IDS technologies best suited to their installation, and provides an evaluation of intrusion detection and surveillance equipment applicable to range applications. CRREL is currently developing the STDTT and TL-See GIS Tool; and draft detailed test plans for the demonstration and validation of these tools are being developed.

Limitations

The Training Land (TL)-See GIS Tool currently being developed will be applicable only to cameras and line-of-sight IDS.

Follow-On Program Requirements

Demonstration and validation testing of the IDS Decision Tree and GIS Tool will be performed in early 2005. The U.S. Army Environmental Center (USAEC) will accomplish technology transfer to interested users in late 2005 or early 2006. IDS technology still must be included in standard range design criteria, and commercialization assessments still must be performed on promising technologies.

Program Partners

U.S. Army Environmental Center

U.S. Army Engineer Research and Engineering Laboratory, Cold Regions Research and Engineering Laboratory

U.S. Army Engineer Research and Engineering Laboratory, Construction Engineering Research Laboratory

Army Training Support Center

Publications

Technology for Range Security. September 2003. US Army Engineer Research and Engineering Laboratory, Cold Regions Research and Engineering Laboratory (CRREL).

Tungsten Small Arms Evaluation

In 1999 and 2000, the Army National Guard at the Massachusetts Military Reservation (MMR) began using a newly developed tungsten nylon bullet for training. Twelve ranges at MMR are being used for training using this new round. Several other installations around the country also use the tungsten round. During development and testing, the solubility of this material was considered a non-issue, as the handbook of chemistry and physics as well as all other literature considered the material "insoluble." Recently, the fate and transport of tungsten on small arms ranges has come into question with the potential solubility of the tungsten nylon bullet as the primary concern.

Purpose

The primary objective is to characterize the mobility of tungsten, lead, and other small arms munitions metal constituents on three installations with varying climate and soil conditions.

Benefits

Knowledge about the field potential of tungsten to move from the bullet fragments into the vadose zone and into either surface water or groundwater.

Technology Users

Range community
Installations

Description

The mobility of tungsten fired at three installations with varying site characteristics will be investigated. This involves the development of quantitative data on the munitions metal constituent levels in soil, groundwater, surface water, storm water, and sediment on the range, and in flow paths leaving the range impact areas. Characterization of the tungsten, lead, antimony, copper, zinc, tin, and iron species developed in the soil matrix will also be determined. The potential for metals mobility will be identified. The data collected will be compared to federal, state, and local water quality requirements and standards.

Follow-On Program Requirements

Sampling plan and field sampling will occur.

Program Partners

ODEP
USAEC
Massachusetts Military Reservation

Unexploded Ordnance Corrosion

Testing and training operations using exploding ordnance continue to play a key role in maintaining the readiness of the warfighter. Roughly 3.5 percent of the rounds used in these operations malfunction, resulting in unexploded ordnance (UXO). Many of these UXO contain high explosives (HE). UXO exists on the surface and buried in soil of impact areas, in wetlands sediment, and in water, under both aerobic and anaerobic conditions. Prior to 1999, data on the condition of existing UXO and its impacts on the environment was not collected or evaluated. Additionally, factors that may affect the condition of UXO (such as munition type, soil type, aqueous conditions, and pH) were not evaluated. This study evaluated the rate and mode of UXO corrosion. We collected soil explosives concentrations beneath a significant portion of ordnance on 14 ranges.

Purpose

Provide the U.S. Army with a tool to assess the site-specific years to perforation for unexploded ordnance (UXO), and evaluate under what conditions, if any, UXO might place explosives into soils on ranges.

Benefits

This project will enable installation range managers to evaluate the potential risk from UXO corrosion and release of munitions-related compounds on their installations. We are developing a user-friendly computer tool that provides the number of years to perforation for a user-specified thickness of metal. This computer tool can be used as a program management aid, giving the range manager and risk assessor information to manage the need and timing for range maintenance. Environmental restrictions on the training of U.S. military personnel will be minimized. Future cleanup costs may be reduced. Furthermore, the environmental stewardship observed will enhance both public image and trust.

Technology Users

U.S. Army Installations
U.S. Army Corps of Engineers
Risk Assessment Community

Description

The Army has a growing need to respond to regulatory questions about the environmental impact of UXO in and around firing ranges. As a result, the University of Louisiana at Lafayette, Praxis Environmental Technologies, the Naval Research Laboratory, and the U.S. Army Corp of Engineers in Huntsville, under the direction of the U.S. Army Environmental Center, addressed these issues. The Strategic Environmental Research and Development Program funded the project, in part. The data gathered for this program provide information on the likelihood of UXO to degrade to the point of perforation. This work addresses whether and how conventional UXO on military test ranges corrodes over time and provides the parameters, assumptions, and constraints of the modeling techniques being used in the development of this UXO corrosion model. Current modeling efforts involve using first principles and literature-reported rates of steel corrosion in soils, and UXO pit depths from a variety of soil and climate types, to revamp the

1999 UXO version of the UXO corrosion empirical algorithm. Corrosion modeling based on soil type and any corrosion by-products was performed using techniques under development at the University of Louisiana at Lafayette. The results of this modeling effort provide input (time to perforation) for future range risk assessments.

Completed work for the Strategic Environmental Research and Development Program (SERDP) gathered 161 ordnance items from 14 sites where the UXO age is well constrained, and over a variety of soil and environmental conditions that may influence corrosion rates. The data generated will support the U.S. Army and Army installations in assessing the environmental impact of weapons firing as a part of testing and training operations.

Accomplishments and Results

Final report, corrosion model, and database were submitted to SERDP in April 2004, containing information on the sampling and results of 14 sites in which approximately 161 ordnance samples for corrosion and associated properties were gathered.

Follow-On Program Requirements

Final model update is expected early in 2005. Modeling report will include several release scenarios to increase the understanding of UXO range risk. Transition of the data corrosion model and release modeling to the Army Range Assessment Modeling System is also expected in 2005, completing the technology transfer of these tools to the users.

Program Partners

U.S. Army Environmental Center

The Strategic Environmental Research and Development Program

Praxis Environmental Technologies

The U.S. Army Engineer Research and Development Center Environmental Laboratory and Cold Regions Research and Engineering Center

Louisiana State University-Lafayette, Corrosion Research Center

The Naval Research Laboratory

U.S. Army Corp of Engineers, Huntsville, Alabama

U.S. Army Center for Health Promotion and Preventive Medicine

Cedric Adams and Associates

Vegetation Wear Tolerance

Military land stewardship integrates natural resources management objectives with land warfare training requirements. The Army Environmental Requirements and Technology Assessments environmental compliance requirements that address these issues include: 2.1.b "…Range and Road Maintenance" and 2.5.e "Sustainable Army Live-Fire Range Design and Maintenance." Meeting these requirements requires plants that can reduce soil erosion under training and rangeland conditions. Erosion can affect the quality of training and range sites and the environment. The Army must constantly balance its military mission and its commitment to the stewardship of millions of acres of land. The military mission requires vegetation, primarily grasses, be as resilient as possible, to maintain realism and control soil erosion. In the future, the military faces increasingly difficult land management challenges. As weapons technology improves, training and testing needs change. Complicating this challenge is the impact of continuing development, especially urbanization, outside military installation boundaries.

Purpose

The purpose of the requirement is to 1) demonstrate the effectiveness of new germ plasms (plants) to better tolerate wear, and appropriate seed mixtures to improve establishment in northern desert climates (Intermountain West); and, 2) develop a planting guide to help land managers establish desired vegetative stands and prevent soil erosion from troop and vehicle traffic on individual installations.

Benefits

The Environmental Cost Analysis Methodology tool, designed to facilitate the gathering and analyzing of economic data in a manner that will allow for more accurate evaluation of investment in pollution prevention technologies, was used to determine savings from this new technology, on reseeding costs. The average annual cost of seeding an acre of moderately used land, assuming a four-year cycle for existing germ plasms and a six-year cycle for the Strategic Environmental Research and Development Program improved germ plasms, resulted in a seed-cost savings of 28 to 33 percent. These erosion prevention techniques could save some or all of these costs.

Technology Users

Many Army facilities will benefit from these improved plants and seeding techniques. The Intermountain West Region contains three major FORSCOM facilities, five AMC facilities, and seven National Guard Bureau locations. The FORSCOM and AMC facilities total covers more than one million acres of land. Individuals at the installations include range and natural resource managers.

Description

Demonstrations will evaluate resiliency of new plants by comparing the improved plants to plant cultivars and mixtures traditionally used at the facility. Evaluations are being conducted at two western training facilities – Yakima Training Center (Washington) and Camp Guernsey (Wyoming). Planting at the two facilities took place in 2002, 2003, and 2004, and another planting is planned in 2005, at Camp Guernsey. Some delays occurred in 2002 due to drought conditions.

Researchers will monitor these demonstration sites for three years. At Yakima, the demonstrations will involve controlled vehicle traffic, submitting the plants to diverse levels of wear. Based on the test results, certain species will be recommended for installations with similar soil and climate conditions. Information on these species will be available on the VegSpec computer program and in a new planting guide, so natural resource and range managers can easily identify and select the plants best suited for their revegetation needs.

Researchers are conducting this demonstration in cooperation with the Environmental Security Technology Certification Program.

Accomplishments and Results

A demonstration plan has been completed for the life of the project, the sites at Camp Guernsey and Yakima Training Center have been seeded, and an initial tracking plan has been developed. Early results show the benefits of using the new germ plasms and mixtures. Greenhouse tests were initiated to assess differences in early root and leaf growth of the new germ plasm lines to compare against standard cultivars. To date, two germ plasm lines have been released.

Follow-On Program Requirements

- Monitor project; make sure vehicle traffic is applied according to the project plan.
- Record results, summarize data, prepare technical report, and publish results.

Program Partners

Environmental Security Technology Certification Program

Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory

Technology Transfer

U.S. Army Environmental (User) Requirements and Technology Assessments

During the first 15 years of Army environmental research, most Research, Development, Test and Evaluation (RDT&E) goals and objectives were established through informal coordination within the Army development community. Given greater emphasis on relevance to Army users, a more rigorous, requirements-based approach was developed in the early 1990s. Since 1993, the environmental user requirements process has been formalized into a two-year cycle aligned with the Program Objective Memorandum process.

Purpose

U.S. Army Environmental (User) Requirements and Technology Assessments (AERTA) serves as the Headquarters Army central repository for environmental user requirements and related information in support of the Army's Environmental Quality Technology (EQT) Program. AERTA facilitates Army's validated and prioritized environmental user requirements to help the RDT&E community identify opportunities for developing and demonstrating improved environmental systems and identify applicable off-

the-shelf technologies to help Army users make informed decisions on technologies that are better, faster and more cost-effective.

BENEFITS

In addition to satisfying the annual Department of Defense (DoD) tri-service reporting requirement to the Environmental Security Technology Requirements Group (ESTRG), the AERTA process enhances communication between the "users" of environmental technologies and the Army's environmental RDT&E community. It gives the RDT&E community a better understanding of users' environmental technology requirements with associated performance metrics, their priorities, and the Army's cost of living with the problem, all of which provide the basis for developing RDT&E environmental technology management plans. AERTA provides Army installations with information on the development and availability of faster and more cost-effective environmental technologies. Organizations with technology requirements can use AERTA to identify and share "lessons learned" in a time of shrinking resources.

TECHNOLOGY USERS

Army and DoD major commands and installations use technologies to satisfy their environmental requirements. AERTA documents technology needs from four user communities: (1) users responsible for installation infrastructure; (2) users responsible for weapons systems acquisition; (3) major commands that use these weapons systems; and (4) agencies responsible for collecting and tracking needs related to infrastructure and weapons systems.

DESCRIPTION

The initial database contained approximately 200 environmentally related operational problems throughout the Army. These were screened to focus on those requiring long-term research and development. These were then prioritized based on six ranking criteria: (1) environmental impact; (2) impact on readiness; (3) annual cost of operating with the unresolved requirement; (4) extent of the problem throughout the Army; (5) impact on quality of life; and (6) regulatory time limits.

The Office of the Assistant Chief of Staff for Installation Management (ACSIM), through the U.S. Army Environmental Center (USAEC), refined and updated these requirements from 1995 through 1997, expanding the scope of the effort into the Technology User Needs Survey (TNS). The Army's environmental databases were analyzed to maximize existing user environmental reporting, and several site visits were conducted across Army installations and major commands. These actions refined the qualitative and quantitative data on user needs and allowed requirements to be compiled in a common format that supports the DoD Tri-Service Environmental Quality Requirements Strategy (prepared by ESTRG). The updated requirements were presented at technology team meetings in 1996 and 1997 for review and validation. The list was narrowed to 142 requirements in 1997 and further focused to 44 requirements in 1999, which were prioritized within each program area (i.e., pillar) by the user community.

The TNS was retailored as a database, tailored to Internet access and was renamed AERTA. AERTA is a database that is kept current through the

Army's EQT and ACSIM's user-requirements process and schedule. In FY03 the Army began a revision to AERTA based on the recent changes to the Chairman Joint Chiefs of Staff Instruction that defines the process for identifying capabilities. In FY04 this revision was suspended pending organizational changes in the overall EQT program.

The AERTA database can be accessed and reviewed on the Defense Environmental Network and Information exchange (DENIX) at www.denix.osd.mil/denix/DOD/Policy/Army/Aerta. The advantage of storing information on the DENIX Web site is that access is restricted to DoD employees and contractors with approved accounts and passwords. To address problems of data management, two versions of the Army's environmental technology requirements are maintained. The first version contains unfiltered information and is maintained on the DENIX Web site. A second version, from which "sensitive" information not readily needed by the public has been deleted, is on the ESTRG Web site at xre22.brooks.af.mil/estrg/estrgtop.htm. The ESTRG site will also identify primary points of contact (one to two per program area, per service) as a gateway for interested parties outside DoD.

Accomplishments and Results

In FY04 we suspended initiation of the JCIDS process to guide the AERTA review while the EQT program considers reorganization.

Limitations

The technology teams are responsible for screening out needs for which the solutions clearly do not involve technology.

Program Partners

U.S. Army Environmental Center

Members of the Army RDT&E community

Army Technology Users

Publications

Army Technology Needs Survey.

Army Environmental Requirements and Technology Assessments. (www.denix.osd.mil/denix/DoD/Policy/Army/Aerta).

Fiscal Year 2002 Army Environmental Requirements and Technology Assessments, Final Report. October 2002.

Army Risk Assessment Modeling System (ARAMS)

Purpose

ARAMS is a computer-based, information delivery, dynamic modeling, analysis system that integrates multimedia fate/transport, exposure, intake/uptake, and effects of contaminants and military-relevant compounds, to assess human and ecological health impacts and risks for existing, baseline, and future conditions.

Benefits

ARAMS can assess human and ecological risks, use measured or predicted exposure data, assess existing or future time-varying exposure/risks, conduct site-specific assessments, conduct screening or comprehensive risk assessments,

assess a wide array of exposure pathways and uptake routes, and provide flexibility for describing exposure and risk scenarios.

Technology Users

ARAMS is available to the entire environmental community free of charge and could be utilized by remediation project managers and cleanup personnel.

Description

The Army Environmental Center has been involved with the Army Engineer Research and Development Center and the Army Center for Health Promotion and Preventive Medicine, to complete ARAMS. ARAMS consists of an object-oriented framework (FRAMES) for linking objects to describe risk scenarios, and provides seamless linkages to Web-based and local databases to filter and load data for assessment. The system has flexible graphical and textual output options that include generating Risk Assessment Guidance for Superfunds (RAGS) reports. ARAMS was designed to perform uncertainty analyses and has modules for multi-media fate transport, exposure, and effects analyses.

Accomplishments and Results

ARAMS was first released June 2002. Version 1.2 was released in June 2004. It is currently being applied at the Massachusetts Military Reservation to evaluate risks from compounds released during future training exercises.

Limitations

Users must have Windows 2000 or XP with 64K RAM, 800 MB of free disk space, and Microsoft Excel and ACCESS.

Follow-On Program Requirements

Version 1.3 will be released in early FY05.

Program Partners

U.S. Army Engineer Research and Development Center
U.S. Army Center for Health Promotion and Preventive Medicine
U.S. Army Environmental Center

Publications

ARAMS is free to download at http://el.erdc.usace.army.mil/arams.

Environmental Quality Technology (EQT) Multimedia Presentation

Purpose

The Environmental Quality Technology (EQT) program focuses research and development, test and evaluation, and technology transfer efforts, to enhance the U.S. Army's ability to train, equip, sustain, and operate with minimal or no impact on the environment. The program's ultimate goal is to implement and transfer efficient, cost-effective methods and systems to the field, reducing or eliminating waste streams, and ensuring a better quality of life for Soldiers, their families, and the surrounding community. The multimedia

presentation will allow the U.S. Army Environmental Center to communicate the purpose, description, and successes of the EQT program, in a unique format.

Benefits

The multimedia presentation will communicate information about the EQT program's goals, structure and successes, so that more people will become aware of the program and what it does to improve the environmental technology situation within the Army.

Technology Users

Army and Department of Defense (DoD) major commands and installations, government agencies, businesses, and academia.

Description

The Army Environmental Center, through a contractor, is developing and preparing a multimedia presentation for the Army's EQT program that uses targeted marketing tactics in a creative multimedia campaign describing the EQT program's value to the Army in providing state-of-the-art technologies that support the Army mission. The presentation utilizes digital video and photography, along with commercial art and graphics, in a three-minute video presentation, and an information-based interactive Web site, a slide-based speaker's viewgraph, and a four-page fact sheet.

Accomplishments and Results

The EQT program is currently being re-evaluated, and while the presentation is currently in the design stage, further work is on hold until the program structure has been finalized.

Follow-On Program Requirements

There will be subsequent presentations in the future to allow for changes to the EQT program and the inclusion of new EQT success stories, to keep the presentation up to date.

Program Partners

U.S. Army Environmental Center

Publications

Non-applicable.

Environmental Technology Symposium and Workshop

Purpose

In this age of increasing technology, it is important for military services, state organizations, and industry to leverage available resources and share information. The Environmental Technology Symposium and Workshop provides such an opportunity. The symposium is a forum for technical exchange and interaction on environmental technology strategies, initiatives, demonstrations, and products.

The symposium provides a forum for technical exchange and interaction on environmental technology strategies, initiatives, demonstrations, and products. Attendees of the symposium are involved in meetings, training, technical sessions, and networking events.

Benefits

The symposium helps disseminate information across the services, reducing the "reinventing the wheel" syndrome. Combining what could be three conferences into one also reduces personnel travel expenses and time away from the office.

Technology Users

Department of Defense (DoD) installations, government agencies, businesses, and academia.

Description

In 1995, the U.S. Army Environmental Center (USAEC) hosted the DoD Environmental Technology Workshop. Bringing together the three military environmental support centers, this venue offered the opportunity for a unified position on environmental technology. The services recognize the need to share information. Since then, the Tri-Service Environmental Support Centers Coordinating Committee has supported the symposium and workshops, previous know as the Tri-Service Environmental Technology Workshops, and ITRC joined us, improving our venue to include state and federal regulatory partnerships, guidance documents, and training sessions. The symposium will also host the Environmental Quality Technology (EQT) Workshop, which will offer technology team breakouts and examine FY04 initiatives.

The three services and ITRC comprised the 2003 organizational committee, where USAEC remained as the chair. The committee's main role was to review and select abstracts for platform presentation; it performed other functions as necessary. The Army is sponsoring the 2005 symposium. The USAEC and support contractor, TRI, will handle the 2005 effort.

Symposium presentations focus on mature technologies of timely interest to participants. Emphasis is placed on technologies that are "field ready" and are currently being demonstrated or have been demonstrated.

Accomplishments and Results

The 2001 Tri-Service Environmental Technology Symposium was held 18-20 June 2001 in San Diego, California. The symposium attracted more than 300 attendees and included 46 exhibitors, 54 platform presentations, and 30 posters. The 2003 Environmental Technology Symposium was held March 24-28 in Charlotte, North Carolina. By the event's end, there were 468 attendees, and more than 35 exhibitors.

Follow-On Program Requirements

The 6th Environmental Technology Symposium is currently being planned and will be held in the spring of FY 2005, in the western United States.

Program Partners

U.S. Army Environmental Center

Naval Facilities Engineering Service Center

Air Force Center for Environmental Excellence

Interstate Technology Regulatory Council

Publications

Proceedings from 1996 workshop. SFIM-AEC-ET-CR-96187.
Proceedings from 1997 workshop. SFIM-AEC-ET-CR-9705.
Proceedings from 1998 workshop available at www.aec.army.mil/.
Proceedings from the 2001 and 2003 conferences.

Low-Cost Hot Gas Decontamination of Explosives-Contaminated Firing Range Scrap

The Department of Defense (DoD) has numerous training, target, bombing, and firing ranges at active installations, Formerly Used Defense Sites (FUDS) and Base Realignment and Closure (BRAC) sites that have accumulated a substantial amount of contaminated scrap metal. Range sweeps generate piles of high-value recyclable scrap metal. Contrary to popular belief, many of these items still contain explosive residues after detonation. Explosive incidents involving scrap metal from training and firing ranges have occurred over the years.

Purpose

Use hot gas technology to achieve an analytically clean level (5X) for explosives-contaminated material by thermally desorbing and destroying the explosives.

Benefits

Hot gas technology has been demonstrated in the past as an effective technology for decontaminating explosives-contaminated materials. Application of this technology was limited to fixed facilities that were effective but expensive to operate. This application of the technology takes the decontamination process to the field where the scrap is located and decontaminates the scrap, in place, more economically, than a fixed facility.

Technology Users

All DoD installations, BRAC sites, and FUDS sites can use this technology. The technology can be applied by installation personnel or can be contracted out.

Description

Hot gas technology is a proven technology that will achieve an analytically clean level (5X) for explosives-contaminated material by thermally desorbing and destroying the explosives. All materials and equipment used in this process are off-the-shelf and readily available. Application of this process to piles of contaminated range scrap involves placing thermocouples in the pile, covering the pile with an insulating blanket, connecting a gas burner to the pile, heating the pile until all of the thermocouples reach the set temperature, and holding the temperature for a set period of time, usually four to six hours.

Accomplishments and Results

The demonstration tests have been successfully completed, and the final technical report is in review.

Limitations

This process cannot be used on unexploded ordnance or other items that are still explosively configured in any way. It is not intended for use on combustible materials.

Follow-On Program Requirements

All reports and manuals were finalized in April 2004. Technology transfer to the services and interested users will be accomplished during 2004, by the U.S. Army Aberdeen Test Center.

Program Partners

U.S. Army Environmental Center
Naval Ordnance Center, Indianhead
U.S. Army Aberdeen Test Center
Parsons Engineering Science

Publications

Design Guidance Manual for Low-Cost Disposable Hot Gas Decontamination System for Explosives-Contaminated Equipment and Facilities. November 1998. Parsons Engineering Science. SFIM-AEC-ET-CR-98046.

Demonstration Results of Hot Gas Decontamination for Explosives at Hawthorne Army Depot, Nevada. September 1995. Tennessee Valley Authority Environmental Research Center. SFIM-AEC-ET-CR-95031.

Hot Gas Decontamination of Explosives-Contaminated Items Process and Facility

Remediation Technologies Screening Matrix and Reference Guide

Several Web-based tools exist that aid Environmental Project Managers in making intelligent, informed decisions on cleanup technologies, but few are as comprehensive as the FRTR Remediation Technologies Screening Matrix and Reference Guide. The Federal Remediation Technologies Roundtable (FRTR) developed this guide to serve as a neutral platform from which to evaluate technologies from all media areas.

Purpose

The Army Environmental Center manages and updates the *FRTR Remediation Technologies Screening Matrix and Reference Guide, Version IV,* to enhance user-friendliness, increase awareness of the document, foster close cooperation between government agencies, and provide an improved technology transfer product to both environmental technology users and the research and development community.

Benefits

The guide serves as a "one-stop shopping" document, allowing remediation project managers to sort through volumes of information in a direct and guided manner, saving them time and effort. The guide can be referenced from a contaminant or technology perspective, dependant on user need. The guide is also recognized as a comprehensive source of environmental restoration technology information.

Technology Users

Remediation Project Managers, government agencies, private organizations, and academia.

Description

In the past, numerous government agencies, divisions and branches produced documents as tools for their environmental project managers. The FRTR sponsored production of the FRTR Remediation Technologies Screening Matrix and Reference Guide to eliminate the duplication of effort among its member agencies.

The document is Web-based, allowing for quick and easy updating. The update effort encourages Roundtable members to work together, leverage funds and resources, and prevent duplication of effort.

The committee representatives, who have the option to serve as a review entity for each technology, select technologies to be included in the guide. After the document is written and reviewed, the information is formatted in HTML, integrated with all necessary hyperlinks and placed on the Internet for universal use. Currently, members of the committee are in the process of updating the Remediation Technologies Screening Matrix and Reference Guide, Version IV.

The current World Wide Web version of the FRTR Remediation Technologies Screening Matrix and Reference Guide, located on the FRTR home page, replaced Version III. Web technology advancements enable the Roundtable the opportunity to update and modify this "living" document. Each week, the guide is reviewed for inactive links and outdated or incorrect information. New information is reviewed and evaluated for validity. This regular maintenance ensures the document's integrity.

Accomplishments and Results

This project helps to demonstrate and foster cooperation among many federal agencies. Committee members established the personal relationships necessary to coordinate the update effort. In the past there has been successful leveraging of resources from the Army, Navy, and Air Force. The Environmental Protection Agency donates significant support. Other agencies dedicate numerous in-house personnel hours toward the effort. The latest screening matrix poster was completed in FY04 and will be available in early FY05.

Limitations

The document was released on the Web at www.frtr.gov, in November 1997.

The document is an electronic Web file, so there is no conveniently accessed paper version. Links must be continually monitored and information updated.

Follow-On Program Requirements

Environmental technologies are continually changing and being improved. Updates to the current version are ongoing. The current update is focusing on the matrix's user-friendliness by improving rating symbols and by updating cost information using a parametric-based cost estimating tool. Committee members have decided the most effective way to keep the guide current and useful is to conduct annual meetings and reviews of existing material.

Program Partners

U.S. Army Environmental Center
U.S. Army Corps of Engineers
Federal Remediation Technologies Roundtable
Naval Facilities Engineering Service Center
Air Force Center for Environmental Excellence
Environmental Protection Agency
U.S. Geological Survey
Department of Energy
National Aeronautics and Space Administration

Publications

Federal Remediation Technologies Screening Matrix and Reference Guide, Version IV. April 2002.

U. S. Army Environmental Center Support to Executive Agent for the National Defense Center for Environmental Excellence

The U.S. Army Environmental Center (USAEC) is providing support to the Department of Defense (DoD) Executive Agent for the National Defense Center for Environmental Excellence. The Executive Agent is the Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health). USAEC is providing Contracting Officer's Representative (COR) and Technical Working Group (TWG) support.

The COR cell is made up of a team of three people, the COR, the Alternate COR (ACOR) and one Department of Army civilian. The COR team has three main functions. First, the COR is responsible for reviewing and approving all deliverables. Second, the COR is responsible for ensuring that all invoices are acceptable. Third, the COR team provides oversight of the contract mechanisms and technical programs. This is done by working with the program director and technical monitors (TM) selected from the appropriate Department of Defense organization for a given task.

The TWG is chartered in the approved National Defense Center for Environmental Excellence (NDCEE) Operating Principles. The Operating Principles provide for a three-tiered management process to assure integration among the DoD components; an Executive Advisory Board, an Executive Advisory Working Group, and the TWG. The TWG members are the high-level technical experts from each service and the Defense Logistics Agency (DLA) who are authorized to speak for the service on high priority needs that the NDCEE can address. The TWG identifies the service TMs for each NDCEE program and oversees the development of the technical effort for each congressionally directed program.

The NDCEE is working on four congressionally directed FY04 funded projects. Three are continuations of FY03 work, UXO, Solid Waste and MANATEE. MANATEE is a project that uses state-of-the-art technology to provide process and environmental information to installation managers over

the installations intranet. The fourth is sustainable installations. The purpose of this task is to develop tools to help installations meet sustainability goals. The current work is being done at the Radford Army Ammunition Plant. The USAEC NDCEE team, as part of their COR responsibilities, is coordinating the technical level efforts across the Department of Defense.

The Army uses a portion of its NDCEE programmed funds for technical work. The FY04 funds are being used for three purposes, to help implement NDCEE-tested technologies at a limited number of DoD sites, start the Sustainable Installation program at a couple of installations, and to look at

UXO/Countermine Forum 2004

In a concerted effort to bring together the best minds from all corners of the world, the annual Unexploded Ordnance (UXO)/Countermine Forum 2004 addressed technology, policy, and regulatory issues related to UXO and countermine. Participants acquired a greater understanding of UXO and countermine issues, how they affect our world today, and the implications for the 21st century.

Purpose

To produce, manage, and host a conference that addresses countermine and UXO technology, policy, and regulatory issues

Benefits

The conference brings together a diverse audience to exchange ideas and information on countermine and UXO.

Description

The UXO/Countermine Forum 2004 addressed technology, policy, and regulatory issues related to UXO.

The UXO/Countermine Forum 2004 was sponsored by the U.S. Department of Defense Explosives Safety Board (DDESB) and hosted by the U.S. Army Environmental Center (USAEC), in cooperation with the Office of the Project Manager for Close Combat Systems, the Unexploded Ordnance Center of Excellence, Naval Explosive Ordnance Disposal Technology Division, U.S. Army Research, Development and Engineering Command, CERDEC, Night Vision Electronic Sensors Directorate, Strategic Environmental Research and Development Program Office, Environmental Security Technology Certification Program Office, U.S. Army Product Manager for Non-Stockpile Chemical Materiel, U.S. Army Engineer Research and Development Center, U.S. Army Aberdeen Test Center, Defense Threat Reduction Agency, Office of the Assistant Secretary of Defense (SO/LIC), and National Association of Ordnance and Explosive Waste Contractors. The next UXO/Countermine Forum will be held in 2005, date to be determined.

Accomplishments and Results

USAEC produced and hosted the UXO/Countermine Forum 2004 in St. Louis, Missouri, 9 thru-12 March 2004. Approximately 1,000 individuals attended.

Follow-On Program Requirements

Include the five Joint UXO Coordination Office mission areas into the UXO/Countermine Forum in 2005. Plan and conduct the next UXO/Countermine Forum in 2005 (location and date to be determined).

Program Partners

U.S. Army Environmental Center
U.S. Department of Defense Explosives Safety Board
Office of the Project Manager for Close Combat Systems
Unexploded Ordnance Center of Excellence
Naval Explosives Ordnance Disposal Technology Division
Office of the Assistant Secretary of Defense Special Operations and Low-Intensity Conflicts
U.S. Army Product Manager for Non-Stockpile Chemical Materiel
U.S. Army Engineer Research and Development Center
National Association of Ordnance and Explosive Waste Contractors
U.S. Army Research, Development and Engineering Command,
CERDEC, Night Vision Electronic Sensors Directorate
Strategic Environmental Research and Development Program Office
Environmental Security Technology Certification Program Office
U.S. Army Aberdeen Test Center
Defense Threat Reduction Agency

Publications

UXO Forum 1997, 1998, 1999, 2000, 2001, 2002, and 2004 conference proceedings.

Unexploded Ordnance

UXO Technology Demonstration Program - EQT

The UXO 2001 Report to Congress estimates that more than 11 million acres in the United States may be contaminated with unexploded ordnance (UXO). This includes approximately 763 formerly used defense sites (FUDS) which must be cleared of UXO by DoD for civilian use and 23 base realignment and closure (BRAC) installations which must be cleared of UXO for reuse, and others requiring restricted access. A mixture of political, regulatory, present technology limitations, and budgetary drivers forces the need to improve the Army's ability to remediate UXO-contaminated sites. The screening, detection, and discrimination of UXO at closed, transferring, and transferred ranges, is the Army's highest priority environmental restoration requirement.

Purpose

The purpose of this program is to take a multi-tiered approach to improve the current state of technology and arrive at reliable and cost-effective solutions to the UXO screening, detection, and discrimination problem.

Benefits

The Army's Environmental Quality Technology (EQT) program focuses specifically on ground-based and shallow water UXO detection and discrimination technologies. The EQT program managers and researchers are actively involved in the DoD's Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP)-funded UXO-related projects, and applicable results from these programs will be leveraged to the fullest extent.

Many of the underlying science and engineering principles associated with the detection and discrimination of UXO as it relates to environmental restoration are similar to those associated with the countermine, explosive ordnance disposal, active range clearance, and humanitarian demining mission areas. Research, development, testing, and evaluation (RDT&E) activities addressing these mission areas are coordinated through the Joint UXO Coordination Office. The EQT program managers are cognizant of the ongoing activities in related mission areas and will ensure conservation of RDT&E resources, by coordinating across mission areas as appropriate and leveraging RDT&E conducted in other mission areas, where possible, to meet UXO remediation needs.

Technology Users

The technologies will be, for the most part, employed by private industry that will use the technologies to provide UXO remediation services to the DoD. The use of the technologies will need regulatory and user acceptance to ensure that the technology, if properly implemented, will meet the established performance metrics. Therefore, within this program, regulatory concerns, buy in, and input will be sought and incorporated.

Description

Current technology cannot effectively or efficiently cover large tracts of land and wide areas under all weather and geophysical conditions for the purpose of screening and identifying areas that potentially contain UXO. The lack of efficient wide-area characterization technologies makes site-specific planning and remediation difficult. The Army EQT program will rely on ESTCP/SERDP programs to advance the state of the art in wide-area survey and will develop advanced sensing, analysis, and positioning technologies that could transition to airborne platforms.

Accomplishments and Results

The program performance metrics are based on testing to be conducted at the Standardized UXO Technology Demonstration Sites. The Standardized UXO Technology Demonstration Sites are at Aberdeen Proving Ground, Maryland, and Yuma Proving Ground, Arizona. Descriptions, standardized procedures, and protocols are clearly established in the Standardized UXO Technology Demonstration Site Program Protocols, January 2002. This was a decision based on the need for absolute levels in the exit criteria. The only approach to ensure repeatable testing and realistic test scenarios is to use standardized sites because of the known ground truth and the stability of the sites. Additional demonstrations will be conducted at live sites to be established through the EQT program, to ensure a correlation between the validated capabilities at the live sites and the standardized sites.

The technologies developed and demonstrated under this program will be required to operate in a wide range of environments where ambient temperatures may range from -30 to +50 deg. C and relative humidity can reach 99 percent.

The systems must be capable of operating in the vicinity of power lines and other sources of electromagnetic interference. In addition, ground-based systems must be water resistant to allow operation during rain or snow conditions. Systems shall have sufficient battery and data storage capacity to allow for five hours of continuous operation without recharging or downloading.

Follow-On Program Requirements

Continue demonstrations at the Standardized UXO Technology Demonstration Sites after FY06.

Program Partners

U.S. Army Environmental Center

U.S. Army Corps of Engineers Engineer Research and Development Center

U.S. Army Corps of Engineers, Engineering and Support Center, Huntsville

Publications

Standardized UXO Technology Demonstration Site Program Protocols, January 2002

The Army Environmental Quality Technology Program A (1.6.a) UXO Screening, Detection, and Discrimination Management Plan, April 2002

The Army Environmental Quality Technology Program A (1.6.a) UXO Screening, Detection, and Discrimination AERTA Requirement, July 1999.

UXO Technology Demonstration Program - NDCEE

The UXO 2001 Report to Congress estimates that more than 11 million acres in the U.S. may be contaminated with unexploded ordnance (UXO). This includes approximately 763 formerly used defense sites (FUDS) which must be cleared of UXO by DoD for civilian use and 23 base realignment and closure (BRAC) installations which must be cleared of UXO for reuse and others requiring restricted access. A mixture of political, regulatory, present technology limitations, and budgetary drivers forces the need to improve the Army's ability to remediate UXO sites.

Purpose

The purpose of this program is to more fully document UXO issues involved in closure and turnover of BRAC installations.

Benefits

This program provides support to the research and development community efforts to improve the capabilities and limitations of sensor technologies ability to detect, discriminate, and remediate UXO-contaminated sites.

Technology Users

The products from this program will support the UXO technology research and development community and ultimately military installations with sites that contain UXO.

Description

The FY04 program will 1) evaluate the state of the art for bullet traps, 2) evaluate EMI influences on live fuzes, 3) evaluate the safety aspects during UXO removal from sediments, 4) survey shallow water detection and

discrimination technologies, 5) continue enhancing the UXO recovery database and transition it to the Corps of Engineers, 6) survey munition constituents and correlate environmental regulations, 7) conduct demonstration of a bulk soil system for separating UXO, 8) continue UXO migration studies, 9) develop a UXO tool box, 10) continue testing the effects of EMI on electronic fuzes, 11) expand functionality of the electronic data collect tool, 12) conduct an enhanced ordnance detectability field study, 13) survey the state of the art for range scrap recycling, 14) evaluate the state of the art for magnetic recovery of UXO, 15) scan ammunition engineering drawings, 16) expand the dud rates versus environmental factors study.

Accomplishments and Results

Results from this program will support efforts across the United States to aid in the development of technologies and protocols for the remediation of UXO sites.

Follow-On Program Requirements

Contingent on congressional funding support.

Program Partners

U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland

U.S. Navy Explosive Ordnance Disposal Technology Div., Indian Head, Maryland

U.S. Army Aberdeen Test Center, Aberdeen Proving Ground, Maryland

U.S. Army Corps of Engineers Engineer Research and Development Center

Environmental Security Technology Certification Program

Strategic Environmental Research & Development Program

U.S. Air Force Robotics Laboratory, Tyndall Air Force Base, Florida

U.S. Army Corps of Engineers, Huntsville, Alabama

U.S. Army Corps of Engineers Waterways Experimental Station, Vicksburg, Mississippi

Department of Defense Explosives Safety Board

U.S. Air Force Research Lab

U.S. Navy NFESC

JUXOCO

Publications

- Subtask 2: UXO Neutralization Technologies Technical Report
- Subtask 4: UXO Recovery Database Technical Report
- The Army Environmental Quality Technology Program Operating Principles of October 2001
- Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01B 15 April 2001.
- Army Regulation 71-9 Requirements Generation
- Department of Defense Directive (DODD) 5000.1 2002
- MIL-STD-331B (Military Standard Fuses and Fuse Components)
- UXO Multi-service Procedures for Operations in Unexploded Ordnance
- Environment, FM 100-38/MCRP 4-5/WP TP 3-02.4.1 ACCPAM 10-752/PACAFPAM 10-752/USAFEPAM 10-752, July 1996.

UXO Technology Demonstration Site Program

The Department of Defense needs to continue advancing methods to detect, locate, discriminate, neutralize, recover, and dispose of unexploded ordnance (UXO). The UXO Technology Demonstration Program was initially conducted at Jefferson Proving Ground, Indiana. The success of that program has necessitated that a new program be instituted this past year, the Standardized UXO Technology Demonstration Site Program. The experience gained from the Standardized UXO Technology Demonstration Site Program will provide the UXO technology developer with sites for the UXO sensor/system technology testing and demonstration. Other products resulting from the program include a screening matrix of system performance, a standardized target repository, standardized protocols for performing geophysical prove-outs, and a variety of technology transfer and marketing materials.

Purpose

To evaluate, establish, and advance UXO Technology performance and make it available to the stakeholders

Benefits

This program has created an in-field experience for the evaluation of UXO technologies in a "real world" situation, under controlled conditions. Baseline technologies were established under the JPG Program, and now technology users will be able to advance these baseline technologies using established standardized UXO technology demonstration sites located at the Aberdeen Proving Ground in Maryland and the Yuma Proving Ground in Arizona. In addition, data collected at these sites will support the development of software algorithms for the detection and discrimination of buried UXO. This program will contribute to the safer and more efficient remediation of UXO sites.

Technology Users

Military installations with sites that contain UXO will contract the remediation efforts through civilian EOD contractors.

Description

Congress mandated the UXO Technology Demonstration Program. Advancements in Unexploded Ordnance (UXO) detection and discrimination technologies are necessary to support the operation, restoration, and transfer of the DoD ranges. UXO characterization technologies can be affected by variations in site terrain, geology, natural or man-made materials, vegetative cover, and weather conditions encountered. The establishment of standardized UXO technology demonstration sites will allow users and developers to define the range of applicability of specific UXO technologies, gather data on sensor and system performance, compare results, and document realistic cost and performance information.

In order to satisfy both the research and development community and the technology demonstration community, the standardized sites are made up of three areas, a Calibration Lane, a Blind Test Grid, and an Open Field Site. The Calibration Lane will allow demonstrators to test their equipment, build a site library, document signal strength, and deal with site-specific variables. The Blind Test Grid allows the demonstrator to operate the sensor system without

platform, coordinate system, or operational concerns. The Open Field Site will document the performance of the entire system in simulated range conditions.

The program will also have a repository of standardized targets (munitions or calibration targets) that have the same model type, configuration, and relative magnetism to each other. These items are available for temporary loan for technology developers to build signature libraries of sensor system performance under various conditions (i.e., soil, climate, geographic, vegetative). In addition, these targets are available to support geophysical prove-outs for the remediation of DoD facilities.

The program has also established standardized protocols for performing geophysical prove-outs. This is a guidance manual that outlines the process of site selection, site construction, test operations, demonstrators' data and field requirements, performance scoring, and site closure procedures. The Standardized UXO Technology Demonstration Site Protocols is a collaboration of several organizations and builds on the experience and expertise of each of the participants to establish realistic and cost effective standardized demonstration sites. These goals are defined and described in the protocols manual.

Accomplishments and Results

Results from this program will be used across the United States to aid the development and use of sensor system technologies for the detection and discrimination of buried UXO and the remediation of UXO sites.

- Technology enhancements
- Technology application
- Technology performance reports
- Technology transfer

Program Partners

U.S. Army Environmental Center

U.S. Army Aberdeen Test Center

U.S. Army Corps of Engineers Engineer Research and Development Center Environmental Security Technology Certification Program

Strategic Environmental Research & Development Program

Appendices

Appendix A

Acronyms

AAA---------- Army Audit Agency
ABCS---------- Army Battle Command Systems
ACE ---------- Advanced Collaborative Environment
ACOR---------- Alternate Contracting Officer's Representative
ACP ---------- Army Cost Position
ACS---------- Aerial Common Sensor
ACSIM---------- Assistant Chief of Staff for Installation Management
ACSW ---------- Advanced Crew Served Weapon
AERTA---------- U.S. Army Environmental Requirements and Technology Assessments
AFM ---------- ATTACC for Munitions
AHS ---------- Ammunition Handling System
AMRAAM---------- Advanced Medium Range Air-to-Air Missile
AOs ---------- Administrative Orders
AR ---------- Army Regulation
AR 200-2 ---------- Environmental Effects of Army Actions
AR 70-1 ---------- Army Acquisition Policy
ARAMS---------- Army Risk Assessment Modeling System
ARDEC ---------- U.S. Army Armament Research, Development and Engineering Center
ARL ---------- U.S. Army Research Laboratory
ARL ---------- Airborne Reconnaissance Low
ARV ---------- Armed Robotic Vehicle
ASA(ALT) ---------- Assistant Secretary of the Army (Acquisition, Logistics and Technology)
ASA(I&E) ---------- Assistant Secretary of the Army (Installations and Environment)
ASARC ---------- Army Systems Acquisition Review Council
ASMD ---------- Air, Space, and Missile Defense
ATC ---------- U.S. Army Aberdeen Test Center
ATD---------- Acquisition and Technology Division
ATGM ---------- Anti-Tank Guided Missile
ATIRCM---------- Advanced Threat Infrared Countermeasures
ATK ---------- Alliant Techsystems Inc.
ATR ---------- Automatic Target Recognition
ATSC ---------- Army Training Support Center
ATTACC ---------- Army Training and Testing Area Carrying Capacity
BFVS---------- Bradley Fighting Vehicle Systems
BLOS/NLOS-------- Beyond-Line-of-Sight/Non-Line-of-Sight
BMC4I---------- Battle Management Command, Control, Communications, Computers, and Intelligence
BRAC ---------- Base Realignment and Closure
BW---------- Biological Warfare
C2---------- Command and Control
C2V---------- Command and Control Vehicle

C4ISR ---------- Command, Control, Computers, Communications Intelligence, Surveillance and Reconnaissance
CAM ---------- Cost Analysis Manual
CAP ---------- Combined Aggregate Program
CARD ---------- Cost Analysis Requirements Description
CCA ---------- Close Combat Attack
CCB ---------- Configuration Control Board
CEAC ---------- U.S. Army Cost and Economic Analysis Center
CERL ---------- Construction Engineering Research Laboratory
CFR ---------- Code of Federal Regulations
CFV ---------- Cavalry Fighting Vehicle
CIDDS ---------- Combat Identification for the Dismounted Soldier
CJCSI ---------- Chairman of the Joint Chiefs of Staff Instruction
CLU ---------- Command Launch Unit
CM ---------- Cruise Missile
CMWS ---------- Common Missile Warning System
COCOM ---------- Joint Combatant Commanders
COE ---------- Common Operating Environment
CONOPS ---------- Concept of Operations
COP ---------- Common Operational Picture
COR ---------- Contracting Officer's Representative
COTS ---------- Commercial Off-the-Shelf
CRB ---------- Cost Review Board
CRREL ---------- Cold Regions Research and Engineering Laboratory
CSS ---------- Combat Support Systems
CV ---------- Commander's Vehicle
CX ---------- Categorical Exclusion
DA ---------- Department of the Army
DAB ---------- Defense Acquisition Board
DDESB ---------- Department of Defense Explosives Safety Board
DENIX ---------- Defense Environmental Network and Information Exchange
DJAS ---------- Defense Joint Accounting System
DL ---------- Distributed Learning
DLA ---------- Defense Logistics Agency
DLS ---------- Distributed Learning System
DMWRFRP --------- Directorate Morale Welfare and Recreation Fund, Recycle Program
DNT ---------- Dinitroluene
DoD ---------- Department of Defense
DoD 5000.2-R ------- Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information System Acquisition Programs
DoD 5000.4-M ------ Department of Defense Cost Analysis Guidance and Procedures
DODD ---------- Department of Defense Directive
DOE ---------- Department of Energy
DOPAA ---------- Description of Proposed Action and Alternatives
DOTMLPF --------- Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and/or Facilities
DPG ---------- Dugway Proving Ground
DPICM ---------- Dual-Purpose Improved Conventional Munition
DTF ---------- Digital Training Facilities

DTPs---------- Detailed Test Plans
DTRA ---------- Defense Threat Reduction Agency
EA ---------- Environmental Assessment
ECP ---------- Engineering Change Proposal
EHRAP---------- Environmental Health Risk Assessment Program
EIS ---------- Environmental Impact Statement
EMI ---------- Electromagnetic Induction
EO---------- Exploding Ordnance
EOD ---------- Explosive Ordnance Disposal
EPA ---------- Environmental Protection Agency
EPA-RTP ---------- EPA-Research Triangle Park
EPAS---------- Environmental Performance Assessment System
EPCRA-TRI -------- Emergency Planning and Community Right-to-Know Act-Toxic Release Inventory
EPLRS ---------- Enhanced Position Location Reporting System
EQLCCE ---------- Environmental Quality Life Cycle Cost Estimate
EQT---------- Environmental Quality Technology
ERDC ---------- U.S. Army Corps of Engineers Engineer Research and Development Center
ER-MLRS ---------- Extended Range Multiple Launch Rocket System
ERP ---------- Enterprise Resource Planning
ESH ---------- Environmental Safety and Health
ESOH ---------- Environment, Safety and Occupational Health
ESTCP ---------- Environmental Security Technology Certification Program
ESTRG---------- Environmental Security Technology Requirements Group
ESV---------- Engineer Squad Vehicle
FAA---------- Functional Area Analysis
FAAD---------- Forward Area Air Defense
FBCB2---------- Force XXI Battle Command Brigade and Below
FCS---------- Future Combat System
FCS---------- Fire Control System
FFMIA ---------- Federal Financial Management Improvement Act
FLIR---------- Forward Looking Infrared
FMTV ---------- Family of Medium Tactical Vehicles
FNA---------- Functional Needs Analysis
FOA ---------- Functional and Operational Analysis
FP---------- Firing Point
FRAMES---------- Framework for Analysis in Multimedia Environmental Systems
FRMV ---------- FCS Recovery and Maintenance Vehicle
FRP ---------- Full Rate Production
FRTR---------- Federal Remediation Technologies Roundtable
FSA---------- Functional Solutions Analysis
FSV---------- Fire Support Vehicle
FUDS---------- Formerly Used Defense Sites
FUE ---------- First Unit Equipped
FW---------- Fixed Wing
GAO---------- General Accounting Office
GC ---------- Gas Chromatograph
GCCS-A ---------- Global Command and Control System-Army
GCSS---------- Global Combat Support System

GCSS-A---------- Global Combat Support System-Army
GD---------- General Dynamics
GFE ---------- Government Furnished Equipment
GFEBS ---------- General Fund Enterprise Business System
GHz ---------- Gigahertz
GIG---------- Global Information Grid
GIS ---------- Geographic Information System
GMLRS ---------- Guided Multiple Launch Rocket System
GOTS---------- Government Off-the-Shelf
GPS---------- Global Positioning System
GRCS ---------- Guardrail Common Sensor
GSA---------- General Services Administration
HE---------- High Explosives
HEAB---------- High Explosive Air Burst
HIMARS ---------- High Mobility Artillery Rocket System
HMMWV ---------- High Mobility Multi-Purpose Wheeled Vehicle
HMX---------- Cyclotetramethylene
HQDA ---------- Headquarters, Department of the Army
HTML---------- Hypertext Markup Language
ICH---------- Improved Cargo Helicopter
ICV ---------- Infantry Carrier Vehicle
IDS ---------- Intrusion Detection Systems
IFCS ---------- Integrated Fire Control Station
IFF ---------- Identification of Friend or Foe
IFV ---------- Infantry Fighting Vehicle
IG ---------- Inspector General
IIR ---------- Imaging Infrared
IMINT ---------- Imagery Intelligence
IMS---------- Intelligent Munitions System
IOT&E ---------- Initial Operational Test and Evaluation
IPT ---------- Integrated Process Team
IR ---------- Infrared
ISR ---------- Intelligence, Surveillance and Reconnaissance
ITAM ---------- Integrated Training Area Management
ITAS ---------- Improved Target Acquisition System
ITRC---------- Interstate Technology Regulatory Council
JBPDS ---------- Joint Biological Point Detection System
JBSDS ---------- Joint Biological Stand-off Detection System
JCB ---------- Joint Control Board
JCIDS---------- Joint Capabilities Integration and Development System
JCM ---------- Joint Common Missile
JFMIP ---------- Joint Financial Management Improvement Program
JLENS---------- Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
JPG ---------- Jefferson Proving Ground
JROC---------- Joint Requirement Oversight Council
JSSED ---------- Joint Service Sensitive Equipment Decontamination
JTRS ---------- Joint Tactical Radio System
JUXOCO---------- Joint Unexploded Ordnance Coordination Office
JVIA ---------- Joint Visual Information Activity

KEM ---------- Kinetic Energy Missile
LCAAP ---------- Lake City Army Ammunition Plant
LCCE's ---------- Life Cycle Cost Estimates
LCEA ---------- Life Cycle Environmental Assessment
LEAD ---------- Letterkenny Army Depot
LM ---------- Lockheed Martin
LOAL ---------- Lock on After Launch
LOBL ---------- Lock on Before Launch
LOSAT ---------- Line-of-Sight Anti-Tank
LRAS3 ---------- Long Range Advanced Scout Surveillance System
LRIP ---------- Low Rate Initial Production
LSI ---------- Lead System Integrator
LW ---------- Land Warrior Infantry
MACOM ---------- Army Materiel Command
MANATEE --------- Managing Army Technology Environmental Enhancements
MASINT ---------- Measurements and Signals Intelligence
MB ---------- Major Budget
MC4 ---------- Medical Communications for Combat Casualty Care
MCB ---------- Mounted Combat System
MC-B ---------- Mortar Carrier B
MCO ---------- Major Combat Operations
MCS ---------- Maneuver Control System
MDAP ---------- Major Defense Acquisition Programs
MEADS ---------- Medium Extended Air Defense System
MEV ---------- Medical Evaluation Vehicle
MGS ---------- Mobile Gun System
MHE ---------- Material Handling Equipment
MILES ---------- Modular Integrated Laser Engagement System
MIPR ---------- Military Interdepartmental Purchase Request
MLRS ---------- Multiple Launch Rocket System
MMR ---------- Massachusetts Military Reservation
MMW ---------- Millimeter Wave
MOUT ---------- Military Operations Urban Terrain
MULE ---------- Multifunction Utility/Logistics and Equipment Vehicle
MV ---------- Medical Vehicle
NAOC ---------- National Association of Ordnance and Explosive Waste Contractors
NATO ---------- North Atlantic Treaty Organization
NAVEOD ---------- U.S. Navy Explosive Ordnance Disposal
NBCRV ---------- Nuclear Biological Chemical Reconnaissance Vehicle
NDCEE ---------- National Defense Center for Environmental Excellence
NEPA ---------- National Environmental Policy Act
NESHAPs ---------- National Environmental Standards for Hazardous Air Pollutants
NLOS ---------- Non-Line of Sight
NLOS-C ---------- Non-Line of Sight - Cannon
NLOS-LS ---------- Non-Line of Sight - Launch System
NLOS-M ---------- Non-Line of Sight - Mortar
NQ ---------- Nitroguanidine
NSWC ---------- Naval Surface Warfare Center-Crane
NTDR ---------- Near Term Digital Radio

O&M ---------- Operation and Maintenance
O&O ---------- Operational and Organizational
OASA (ILE) --------- Office of the Assistant Secretary of the Army for Installations, Logistics and Environment
ODASA-CE---------- Office of the Deputy Assistant Secretary of the Army for Cost and Economics
ODCs ---------- Ozone Depleting Chemicals
OEMs ---------- Original Equipment Manufacturers
OIF/OEF---------- Operation Iraqi Freedom/Operation Enduring Freedom
ORD ---------- Requirements Document
ORNL ---------- Oak Ridge National Laboratory
ORR---------- Operational Readiness Rates
P2AD---------- Pollution Prevention Assistance Division
PAC-3 ---------- PATRIOT Advanced Capability-3
PATRIOT ---------- Phased Array Tracking to Intercept of Target
PEO ---------- Program Executive Office
PESHE ---------- Programmatic Environmental, Safety and Health Evaluation
PGMM---------- Precision Guided Mortar Munition
PM---------- Program Manager
PMO ---------- Program Manager's Office
POE ---------- Program Office Estimate
PTIR ---------- Precision Track and Illumination Radar
PVT ---------- Production Validation Test
QC ---------- Quality Control
QPLs ---------- Qualified Products Lists
R&D ---------- Research and Development
R&SV ---------- Reconnaissance and Surveillance Vehicle
RAGS ---------- Risk Assessment Guidance for Superfunds
RAM ---------- Reliability, Availability and Maintainability
RDA---------- Research, Development and Acquisition
RDT&E ---------- Research, Development, Test and Evaluation
RDX---------- Royal Demolition Explosive
REC ---------- Record of Environmental Consideration
RFMSS ---------- Range Facility Management Support System
RISTA ---------- Reconnaissance, Intelligence, Surveillance and Target Acquisition
RSTA ---------- Reconnaissance, Surveillance and Target Acquisition
RSV---------- Re-supply Vehicles
RV ---------- Reconnaissance Vehicle
RW ---------- Rotary Wing
RWS---------- Remote Weapon Station
SAL---------- Semi-Active Laser
SBCT ---------- Stryker Brigade Combat Team
SCA---------- Software Communications Architecture
SCM---------- Source Characterization Model
SD&D/SDD -------- System Development and Demonstration
SDR ---------- Software Defined Radios
SECDEF ---------- Secretary of Defense
SERDP ---------- Strategic Environmental Research and Development Program

SFM ---------- Sensor Fuzed Munitions
SGS---------- Smoke Generator System
SHORAD ---------- Short-Range Air Defense
SI---------- Systems Integrator
SIAP---------- Semi-Automated Imagery Processing
SIGINT ---------- Signals Intelligence
SLAMRAAM-------- Surface Launched Advanced Medium Range Air-to-Air Missile
SO/LIC ---------- Special Operations and Low-Intensity Conflicts
SOMARDS ---------- Standard Operations and Maintenance, Army R&D System
SoS---------- System of Systems
SoS COE ---------- System of System Common Operating Environment
SP ---------- Smoke/Pyrotechnics
SPOTA ---------- Sustainable Painting Operations for the Total Army
SR---------- Surveillance Radar
SSC ---------- Small-Scale Contingencies
STANFINS---------- Standard Finance Systems
STRAC ---------- Standards in Training Commission
SUGV ---------- Small Unmanned Ground Vehicle
TA/FCS ---------- Target Acquisition/Fire Control System
TACMS ---------- Tactical Missile System
TACP ---------- Tactical Control Party
TC-AIM ---------- Transportation Coordinators-Automated Information for Movement Management
TEMP ---------- Test and Evaluation Master Plan
TM ---------- Technical Monitors
TNS---------- Technology User Needs Survey
TNT ---------- Trinitrotoluene
TOW---------- Tube-launched, Optically Tracked, Wire-guided
TRI---------- Technical Resources International
TSM-CCMS--------- TRADOC System Manager - Close Combat Missile Systems
TSP---------- Total Suspended Particulate
TUAs---------- Target Uncertainty Areas
TWG ---------- Technical Working Group
UA ---------- Unit of Action
UAV ---------- Unmanned Aerial Vehicle
UCAVs---------- Unmanned Combat Aerial Vehicles
UDLP---------- United Defense Limited Partnership
UE ---------- Unit of Employment
UGS ---------- Unattended Ground Sensors
UK ---------- United Kingdom
USACHPPM -------- U.S. Army Center for Health Promotion and Preventive Medicine
USAEC ---------- U.S. Army Environmental Center
USAFRL ---------- U.S. Air Force Research Laboratory
USAIC ---------- U.S. Army Infantry Center
USMC ---------- United States Marine Corps
UXO---------- Unexploded Ordnance
VOC---------- Volatile Organic Compound
WBS---------- Work Breakdown Structure
WIN-T---------- Warfighter Information Network-Tactical
WIPT ---------- Working-Level Integrated Product Team

Appendix B

Program Partners

Aerodyne Research Inc.
Air Force Center for Environmental Excellence
Army installations
Army Materiel Command
Army Multimedia and Visual Information Directorate
Army Research and Development Center (ARDEC), Picatinny Arsenal, N.J.
Army Training Support Center (ATSC)
Augusta Chronicle

Booz Allen Hamilton

Cedric Adams and Associates
CERDEC, Night Vision Electronic Sensors Directorate

Department of Defense Explosives Safety Board (DDESB)
Department of Energy

Edgewood Chemical and Biological Center (ECBC)
Environmental Protection Agency
Environmental Security Technology Certification Program (ESTCP)
Environmental Security Technology Certification Program Office

Federal Remediation Technologies Roundtable
Florida Department of Environmental Protection
Fort Gordon, Ga.

Georgia P2AD

Installation Management Agency Headquarters
Interstate Technology Regulatory Council

Louisiana State University-Lafayette, Corrosion Research Center

Massachusetts Military Reservation (MMR)

National Aeronautics and Space Administration
National Association of Ordnance and Explosive Waste Contractors
National Defense Center for Environmental Excellence
Naval Explosives Ordnance Disposal Technology Division
Naval Facilities Engineering Service Center
Naval Ordnance Center, Indian Head, Md.
Naval Research Laboratory

Office of the Assistant Chief of Staff for Installation Management
Office of the Assistant Secretary of Defense Special Operations and Low-Intensity Conflicts
Office of the Department of Environmental Programs for the Assistant Chief of Staff for Installation Management

Office of the Deputy Assistant Secretary of the Army for Cost and Economics
Office of the Director of Environmental Programs
Office of the Environmental Safety and Occupational Health for the Assistant Secretary of the Army for Installations and Environment
Office of the Project Manager for Close Combat Systems

Parsons Engineering Science
Pine Bluff Arsenal
Praxis Environmental Technologies

Strategic Environmental R&D Program Office
Strategic Environmental Research and Development Program (SERDP)

Teledyne Solutions Incorporated

U.S Army Cost and Economic Analysis Center
U.S. Air Force Research Lab
U.S. Air Force Robotics Laboratory, Tyndall Air Force Base, Fla.
U.S. Army Aberdeen Test Center (ATC)
U.S. Army Center for Health Promotion and Preventive Medicine
U.S. Army Corps of Engineers
U.S. Army Corps of Engineers Engineer Research and Development Center (ERDC)
U.S. Army Corps of Engineers Waterways Experimental Station, Vicksburg, Miss.
U.S. Army Corps of Engineers, Engineering and Support Center, Huntsville, Ala.
U.S. Army Engineer Research and Engineering Laboratory, Cold Regions Research and Engineering Laboratory (CRREL)
U.S. Army Engineer Research and Engineering Laboratory, Construction Engineering Research
Laboratory (CERL)
U.S. Army Environmental Center (USAEC)
U.S. Army Product Manager for Non-Stockpile Chemical Materiel
U.S. Army Research, Development and Engineering Command
U.S. Army Space and Missile Defense Command
U.S. Army West Deseret Test Center, Dugway Proving Ground, Utah
U.S. Environmental Protection Agency, Region 2
U.S. Geological Survey

Unexploded Ordnance Center of Excellence
University of Florida School of Architecture

Various PM offices